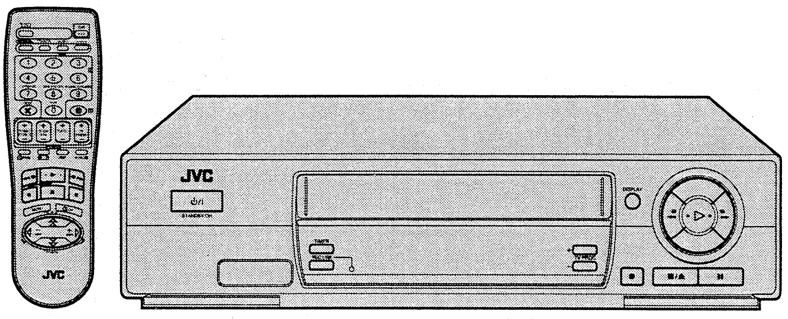
JVC

SERVICE MANUAL

VIDEO CASSETTE RECORDER

HR-J260EK/J265EK/J465EK



VIDEO Plus+

VHS
PAL

SPECIFICATIONS *(The specifications shown pertain specifically to the model HR-J465EK)*

GENERAL

Power requirement	: AC 220 – 240 V∿, 50/60 Hz
Power consumption	
Power on	: 18 W
Power off	: 4.5 W
Temperature	
Operating	: 5°C to 40°C
Storage	: –20°C to 60°C
Operating position	: Horizontal only
Dimensions (WxHxD)	: 400 x 94 x 275 mm
Weight	: 3.5 kg
Format	: VHS PAL standard
Maximum recording time	
(SP)	: 240 min. with E-240 video cassette
(LP)	: 480 min. with E-240 video cassette

VIDEO/AUDIO

Signal system	: PAL-type colour signal and CCIR monochrome signal, 625 lines/50 fields
Recording system	: DA4 (Double Azimuth) helical scan system
Signal-to-noise ratio	: 45 dB
Horizontal resolution	: 250 lines
Frequency range	: 70 Hz to 10,000 Hz
Input/Output	: 21-pin scart connectors (IN/OUT x 1, IN/DECODER x 1)

TUNER/TIMER

TV channel storage capacity	: 99 positions (+AUX position)
Tuning system	: Frequency synthesized tuner
Channel coverage	: UHF channels 21 – 69 (470 – 862 MHz)
Aerial output	: UHF channels 22 – 69 (Adjustable)
Memory backup time	: Approx. 10 min.

ACCESSORIES

Provided accessories	: RF cable, Infrared remote control unit, "AA" battery x 2

Specifications shown are for SP mode unless otherwise specified.
E.& O.E. Design and specifications subject to change without notice.

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TABLE OF CONTENTS

Section Title Page

Safety Precautions

INSTRUCTIONS

1. DISASSEMBLY

1.1 DISASSEMBLY FLOW CHART 1-1
1.2 HOW TO READ THE DISASSEMBLY AND ASSEMBLY 1-1
1.3 DISASSEMBLY/ASSEMBLY METHOD 1-1
1.4 SERVICE POSITION 1-4
  1.4.1 How to take out the Mechanism and Main board assemblies . 1-4
1.5 MECHANISM SERVICE MODE 1-5
  1.5.1 How to set the "MECHANISM SERVICE MODE" 1-5
1.6 EMERGENCY DISPLAY FUNCTION 1-6
  1.6.1 How to display record of an emergency faults 1-6
  1.6.2 Detail of emergency faults 1-6
  1.6.3 How to clear emergency record 1-6
1.7 SYSCON CIRCUIT 1-7
  1.7.1 Syscon CPU pin function (IC3001) 1/2 1-7
  1.7.2 Syscon CPU pin function (IC3001) 2/2 1-8

2. MECHANISM ADJUSTMENT

2.1 BEFORE STARTING REPAIR AND ADJUSTMENT 2-1
  2.1.1 Precautions 2-1
  2.1.2 Checking for Proper Mechanical Operations 2-1
  2.1.3 Manually Removing the Cassette Tape 2-1
  2.1.4 Jigs and Tools Required for Adjustment 2-3
  2.1.5 Maintenance and Inspection 2-3
2.2 REPLACEMENT OF MAJOR PARTS 2-6
  2.2.1 Before Starting Disassembling (Phase matching between mechanical parts) 2-6
  2.2.2 How to Set the Mechanism Assembling Mode 2-7
  2.2.3 Cassette Holder Assembly 2-7
  2.2.4 Pinch Roller Arm Assembly 2-10
  2.2.5 Guide Arm Assembly and Press Lever Assembly 2-10
  2.2.6 Audio Control Head 2-10
  2.2.7 Loading Motor 2-11
  2.2.8 Capstan Motor 2-11
  2.2.9 Pole Base Assembly (supply or take-up side) 2-12
  2.2.10 Rotary Encoder 2-12
  2.2.11 Clutch Unit 2-13
  2.2.12 Change Lever Assembly, Direct Gear and Clutch Gear1 . 2-13
  2.2.13 Link Lever 2-13
  2.2.14 Cassette Gear, Control Cam and Worm Gear 2-14
  2.2.15 Control Plate 2-14
  2.2.16 Loading Arm Gear (supply or take-up side) and Loading Arm Gear Shaft 2-15
  2.2.17 Take-up Lever, Take-up Head and Control Plate Guide . 2-16
  2.2.18 Capstan Brake Assembly 2-17
  2.2.19 Sub Brake Assembly (take-up side) 2-17
  2.2.20 Main Brake Assembly (take-up side), Reel Disk (take-up side) and Main Brake Assembly (supply side) .. 2-17
  2.2.21 Tension Brake Assembly, Reel Disk (supply side) and Tension Arm Assembly 2-18
  2.2.22 Idler Lever, Idler Arm Assembly 2-18
  2.2.23 Stator Assembly 2-18
  2.2.24 Rotor Assembly 2-19
  2.2.25 Upper Drum Assembly 2-19

Section Title Page
2.3 COMPATIBILITY ADJUSTMENT 2-20
  2.3.1 Checking/Adjustment of FM Waveform Linearity 2-20
  2.3.2 Checking/Adjustment of the Height and Tilt of the Audio Control Head 2-22
  2.3.3 Checking/Adjustment of the Audio Control Head Phase (X-Value) 2-22
  2.3.4 Checking/Adjustment the Standard Tracking Preset [HR-J465EK] 2-23
  2.3.5 Checking/Adjustment of the Tension Pole 2-23
  2.3.6 Adjustment of the Tension Stud 2-23
  2.3.7 Main Brake Torque Adjustment 2-23

3. ELECTRICAL ADJUSTMENT

3.1 PRECAUTION 3-1
  3.1.1 Required test equipment 3-1
  3.1.2 Required adjustment tools 3-1
  3.1.3 Colour bar signal,colour bar pattern 3-1
3.2 SERVO CIRCUIT 3-2
  3.2.1 PB switching point 3-2
  3.2.2 Slow tracking preset [HR-J465EK] 3-2
  3.2.3 Slow tracking preset [HR-J260EK/J265EK] 3-3
3.3 VIDEO CIRCUIT 3-3
  3.3.1 Auto picture 3-3
3.4 ON SCREEN CIRCUIT 3-4
  3.4.1 Character position 3-4

4. CHARTS AND DIAGRAMS

NOTES OF SCHEMATIC DIAGRAM 4-1
CIRCUIT BOARD NOTES 4-2
4.1 BOARD INTERCONNECTIONS 4-3
4.2 VIDEO/N.AUDIO SCHEMATIC DIAGRAM 4-5
4.3 ON SCREEN SCHEMATIC DIAGRAM 4-7
4.4 SYSTEM CONTROL SCHEMATIC DIAGRAM 4-9
4.5 SWITCHING REGULATOR SCHEMATIC DIAGRAM 4-11
4.6 TUNER SCHEMATIC DIAGRAM 4-13
4.7 TERMINAL SCHEMATIC DIAGRAM 4-15
4.8 SW/DISPLAY AND LED SCHEMATIC DIAGRAMS 4-17
4.9 MAIN, A/C HEAD AND LED CIRCUIT BOARDS 4-21
4.10 FDP GRID ASSIGNMENT AND ANODE CONNECTION .. 4-23
4.11 REMOTE CONTROL SCHEMATIC DIAGRAM 4-24
4.12 VOLTAGE CHARTS 4-25
4.13 SYSTEM CONTROL BLOCK DIAGRAM 4-27
4.14 VIDEO BLOCK DIAGRAM 4-29
4.15 AUDIO BLOCK DIAGRAM 4-31

5. PARTS LIST

5.1 PACKING AND ACCESSORY ASSEMBLY <M1> 5-1
5.2 CABINET AND CHASSIS ASSEMBLY <M2> 5-2
5.3 MECHANISM ASSEMBLY <M4> 5-4
5.4 ELECTRICAL PARTS LIST 5-6
  MAIN BOARD ASSEMBLY <03> 5-6
  AUDIO CONTROL HEAD BOARD ASSEMBLY <12> 5-11
  LOADING MOTOR BOARD ASSEMBLY<55> 5-11
  LED BOARD ASSEMBLY <90> 5-11

The following table lists the differing points between Models (HR-J260EK, HR-J265EK and HR-J465EK) in this series.

	HR-J260EK	HR-J265EK	HR-J465EK
FRONT PANEL COLOUR	DARK GRAY	BLACK	BLACK
VIDEO HEAD	2 HEAD	2 HEAD	4 HEAD
STILL/PAUSE/FRAME ADVANCE	REDUCED NOISE	REDUCED NOISE	NOISELESS

Safety Precautions

1. This design of this product contains special hardware and many circuits and components specially for safety purposes. For continued protection, no changes should be made to the original design unless authorised in writing by the manufacturer. Replacement parts must be identical to those used in the original circuits.
2. Any unauthorised design alterations or additions will void the manufacturer's guarantee ; furthermore the manufacturer cannot accept responsibility for personal injury or property damage resulting therefrom.
3. Essential safety critical components are identified by (⚠) on the Parts List and by shading on the schematics, and must never be replaced by parts other than those listed in the manual. please note however that many electrical and mechanical parts in the product have special safety related characteristics. These characteristics are often not evident from visual inspection. Parts other than specified by the manufacturer may not have the same safety characteristics as the recommended replacement parts shown in the Parts List of the Service manual and may create shock, fire, or other hazards.
4. The leads in the products are routed and dressed with ties, clamps, tubings, barriers and the like to be separated from live parts, high temperature parts, moving parts and/or sharp edges for the prevention of electric shock and fire hazard. When service is required, the original lead routing and dress should be observed, and it should be confirmed that they have been returned to normal, after re-assembling.

Warning

1. Service should be performed by qualified personnel only.
2. This equipment has been designed and manufactured to meet international safety standards.
3. It is the legal responsibility of the repairer to ensure that these safety standards are maintained.
4. Repairs must be made in accordance with the relevant safety standards.
5. It is essential that safety critical components are replaced by approved parts.
6. If mains voltage selector is provided, check setting for local voltage.

INSTRUCTIONS

[This instruction manual is for
HR-J260EK. HR-J265EK. HR-J265ES and HR-J465EK.]

Safety Precautions

The rating plate and the safety caution are on the rear of the unit.

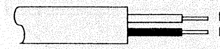
WARNING: DANGEROUS VOLTAGE INSIDE
WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.

IMPORTANT

- Please read the various precautions on p. 2 – 3 of this instruction manual before installing or operating the recorder.
- It should be noted that it may be unlawful to re-record pre-recorded tapes, records, or discs without the consent of the owner of copyright in the sound or video recording, broadcast or cable programme and in any literary, dramatic, musical, or artistic work embodied therein.

IMPORTANT

Connection to the mains supply in the United Kingdom.
DO NOT cut off the mains plug from this equipment. If the plug fitted is not suitable for the power points in your home or the cable is too short to reach a power point, then obtain a proper safety approved extension lead/adapter or consult your dealer.
In the unlikely event of the plug fuse failing be sure to replace the fuse only with an identical approved type, as originally fitted, and to replace the fuse cover. If the fuse fails again consult your nearest JVC dealer.
If nonetheless the mains plug is cut off remove the fuse and dispose of the plug immediately, to avoid a possible shock hazard by inadvertent connection to the mains supply.
If this product is not supplied fitted with a mains plug then follow the instructions given below:
DO NOT make any connection to the Larger Terminal coded E or Green.
The wires in the mains lead are coloured in accordance with the following code:



If these colours do not correspond with the terminal identifications of your plug, connect as follows:
Blue wire to terminal coded N (Neutral) or coloured Black.
Brown wire to terminal coded L (Live) or coloured Red.
If in doubt — consult a competent electrician.

VHS PAL HQ VIDEO Plus+

- Cassettes marked "VHS" (or "S-VHS") can be used with this video recorder. However, only VHS recordings can be made and played back.
- HQ VHS is compatible with existing VHS equipment.
- VIDEO Plus+ and PlusCode are registered trademarks of Gemstar Development Corporation. The VIDEO Plus+ system is manufactured under license from Gemstar Development Corporation.

CAUTION

- When you are not using the recorder for a long period of time, it is recommended that you disconnect the power cord from the mains outlet.
- Dangerous voltage inside. Refer internal servicing to qualified service personnel. To prevent electric shock or fire hazard, remove the power cord from the mains outlet prior to connecting or disconnecting any signal lead or aerial.

The STANDBY/ON ⏻/I button does not completely shut off mains power from the unit, but switches operating current on and off. " ⏻ " shows electrical power standby and " I " shows ON.

Video tapes recorded with this video recorder in the LP (Long Play) mode cannot be played back on a single-speed video recorder.

Failure to heed the following precautions may result in damage to the recorder, remote control or video cassette.

1. **DO NOT place the recorder . . .**
   ... in an environment prone to extreme temperatures or humidity.
   ... in direct sunlight.
   ... in a dusty environment.
   ... in an environment where strong magnetic fields are generated.
   ... on a surface that is unstable or subject to vibration.
2. **DO NOT block the recorder's ventilation openings.**
3. **DO NOT place heavy objects on the recorder or remote control.**
4. **DO NOT place anything which might spill on top of the recorder or remote control.**
5. **AVOID violent shocks to the recorder during transport.**

MOISTURE CONDENSATION

Moisture in the air will condense on the recorder when you move it from a cold place to a warm place, or under extremely humid conditions—just as water droplets form in the surface of a glass filled with cold liquid. Moisture condensation on the head drum will cause damage to the tape. In conditions where condensation may occur, keep the recorder turned on for a few hours to let the moisture dry.

ABOUT HEAD CLEANING

Accumulation of dirt and other particles on the video heads may cause the playback picture to become blurred or interrupted. Be sure to contact your nearest JVC dealer if such troubles occur.

Some Do's And Don'ts On The Safe Use Of Equipment

This equipment has been designed and manufactured to meet international safety standards but, like any electrical equipment, care must be taken if you are to obtain the best results and safety is to be assured.

DO read the operating instructions before you attempt to use the equipment.
DO ensure that all electrical connections (including the mains plug, extension leads and interconnections between pieces of equipment) are properly made and in accordance with the manufacturer's instructions. Switch off and withdraw the mains plug when making or changing connections.
DO consult your dealer if you are ever in doubt about the installation, operation or safety of your equipment.
DO be careful with glass panels or doors on equipment.

DON'T continue to operate the equipment if you are in any doubt about it working normally, or if it is damaged in any way — switch off, withdraw the mains plug and consult your dealer.
DON'T remove any fixed cover as this may expose dangerous voltages.
DON'T leave equipment switched on when it is unattended unless it is specifically stated that it is designed for unattended operation or has a standby mode. Switch off using the switch on the equipment and make sure that your family knows how to do this. Special arrangements may need to be made for infirm or handicapped people.
DON'T use equipment such as personal stereos or radios so that you are distracted from the requirements of road safety. It is illegal to watch television whilst driving.
DON'T listen to headphones at high volume, as such use can permanently damage your hearing.
DON'T obstruct the ventilation of the equipment, for example with curtains or soft furnishings. Overheating will cause damage and shorten the life of the equipment.
DON'T use makeshift stands and NEVER fix legs with wood screws — to ensure complete safety always fit the manufacturer's approved stand or legs with the fixings provided according to the instructions.
DON'T allow electrical equipment to be exposed to rain or moisture.

ABOVE ALL...

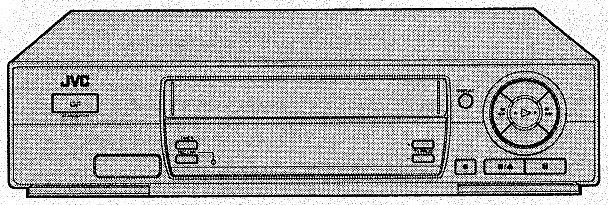
— **NEVER** let anyone especially children push anything into holes, slots or any other opening in the case — this could result in a fatal electrical shock;
— **NEVER** guess or take chances with electrical equipment of any kind — it is better to be safe than sorry!

Dear Customer,

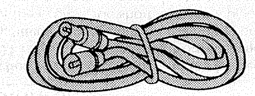
Thank you for purchasing this JVC Video Cassette Recorder.
Please use this **QUICK SET UP GUIDE** to help you to set up your video cassette recorder.

STEP 1 CHECK THE CONTENTS

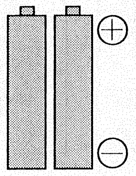
CHECK ALL THE CONTENTS SHOWN BELOW



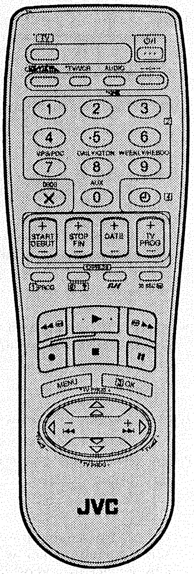
Video Cassette Recorder



RF Cable



"AA" Batteries (x 2)


1
2
3
4
5
6
7
8
9
0
START
STOP
DATE
TV PROG
MENU
OK
JVC

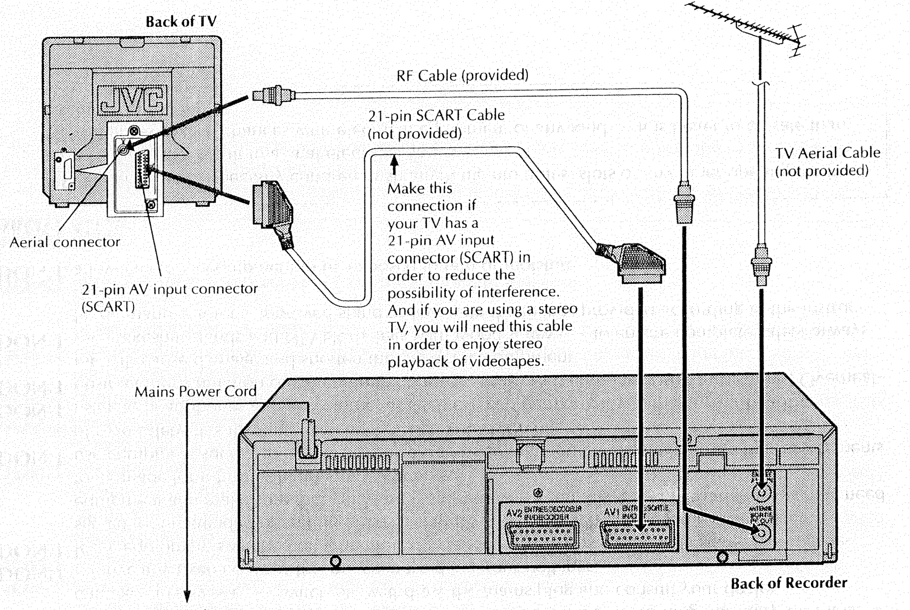
Infrared Remote Control Unit

You are now ready to install your video recorder.

STEP 2 INSTALLATION

CONNECT VIDEO RECORDER TO TV

Place the recorder on a stable, flat surface.


Back of TV
JVC
RF Cable (provided)
21-pin SCART Cable
(not provided)
TV Aerial Cable
(not provided)
Aerial connector
21-pin AV input connector
(SCART)
Mains Power Cord
AV2
AV1
Back of Recorder
Mains outlet

Make this connection if your TV has a 21-pin AV input connector (SCART) in order to reduce the possibility of interference. And if you are using a stereo TV, you will need this cable in order to enjoy stereo playback of videotapes.

RF CONNECTION

To Connect To A TV With NO 21-pin AV input connector (SCART) . . .

1– Disconnect the TV aerial cable from the TV.
2– Connect the TV aerial cable to the ANT. IN jack on the rear panel of the recorder.
3– Connect the provided RF cable between the RF. OUT jack on the rear panel of the recorder and the TV's aerial connector.

AV CONNECTION

To Connect To A TV With 21-pin AV input connector (SCART) . . .

1– Connect the aerial, recorder and TV as per "RF CONNECTION".
2– Connect an optional SCART cable between the AV1 IN/OUT connector on the rear panel of the recorder and the TV's 21-pin AV input connector (SCART).

ATTENTION

- Do NOT Plug the mains power cord into a mains outlet until all connections are completed.
- Do NOT press the ⏻/I button on the recorder or on the remote control to turn on the recorder's power before you start the Auto Set Up procedure described on page 6.

AFTER YOU FINISH THIS STEP ▶ *Go to Step 3 – AUTO SET UP*

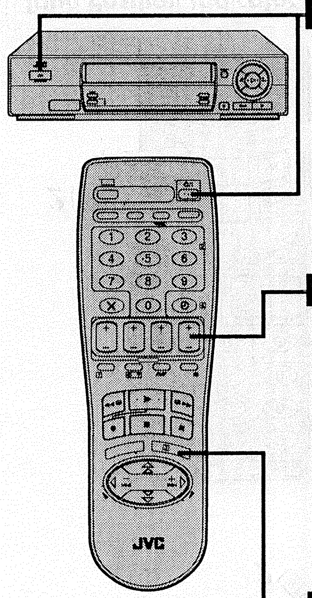
STEP 3 AUTO SET UP

SET THE TUNER CHANNELS, CLOCK, GUIDE PROGRAM NUMBERS AND VIDEO CHANNEL*

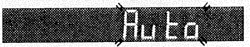
The Auto Set Up function sets the tuner channels, clock, VIDEO Plus+ assigned Guide Program numbers and the video channel* automatically the first time the ⏻/I button on the recorder or on the remote is pressed to turn on the recorder after the mains power cord has been plugged into a mains outlet.

* *Useful if you have connected the video recorder to your TV via RF connection (☞ pg. 5). Video Channel (RF output channel) is the channel on which your TV receives picture and sound signals from the video recorder through the RF cable.*

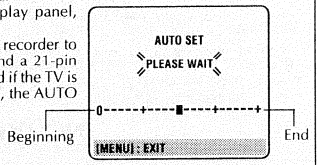
Before performing the following procedure, make sure that:
- the TV aerial cable is connected to the recorder.
- the mains power cord is plugged into the mains outlet.
- batteries have been installed in the remote control.



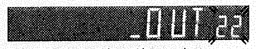
1 Press ⏻/I.
"Auto" appears on the display panel and blinks; do NOT press any button on the recorder or remote control until the display panel shows either the display as illustrated below in item **2** or "– – :– –". Auto Set Up usually takes about 4 – 12 minutes; the duration varies by area.



- If "– – :– –" appears on the display panel, refer to next page.
- If you have connected the video recorder to your TV via both an RF cable and a 21-pin SCART cable (AV connection) and if the TV is turned on and set to its AV mode, the AUTO SET screen will appear.

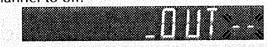


2
- ***If you have connected the video recorder to your TV via an RF cable only (RF connection)*** — the channel that is shown on the display panel is your Video Channel.
To view picture signals from the video recorder, set your TV to the Video Channel. — Refer to the instructions supplied with your TV set for how to do this.



Go to item **3**.

- ***If you have connected the video recorder to your TV via both an RF cable and a 21-pin SCART cable (AV connection)*** — you do not need the video channel so you have to set the video channel to off.
Press **TV PROG** – until the display panel shows "_OUT– –" to set the Video Channel to off.
To view picture signals from the video recorder, set your TV to its AV mode. — Refer to the instructions supplied with your TV set for how to do this.



Go to item **3**.

3 Press **OK** to finish Auto Set Up and refer to next page to check the results.

ATTENTION

Once you have performed Auto Set Up, all the stored stations, Guide Program numbers and the video channel remain in the recorder's memory and the recorder will not perform Auto Set Up again. If there is a power cut and the recorder's memory backup expires you only need to reset the clock. (☞ pg. 37)

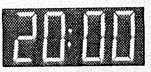
If you have moved to a different area, perform each setting as required.
- Video Channel setting (for RF connection users) ☞ pg. 28
- Tuner setting ☞ pg. 30
- Clock setting ☞ pg. 37

If a new station begins broadcasting in your area, perform tuner setting (☞ pg. 30) and, if necessary, video channel setting (☞ pg. 28).

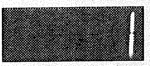
NOTES:

- *Auto channel set function takes place first; it assigns automatically all receivable stations in your area.*
- *Auto clock set function sets the clock automatically.*
- *During auto channel set, the recorder recognizes each station name of the detected stations and stores them in the recorder's memory, then automatically sets the VIDEO Plus+ assigned Guide Program number for those stations according to the broadcast area.*
- ***For RF connection users:*** *The video recorder detects the channels which are not occupied by local stations and selects one channel automatically for your Video Channel that is located in the middle of more than 5 vacant channels.*
- *If there is power cut or if you press ⏻/I or **MENU** while Auto Set Up is in progress, Auto Set Up will be interrupted; be sure to turn off the recorder power once and press ⏻/I to turn the power back on in order to re-start Auto Set Up.*

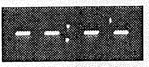
Auto Set Up results appear on the display panel

A


When both auto channel set and auto clock set have been completed successfully the correct current time will be displayed after the **OK** button is pressed in item **3** on page 6.

B


When auto channel set has been completed successfully but auto clock set has not, "(PR)1" will be displayed after the **OK** button is pressed in item **3** on page 6.

C


When neither auto channel set nor auto clock set has been completed successfully, "– –:– –" will be displayed.

* You can check if the Guide Program numbers have been set correctly when you perform VIDEO Plus+ Timer Programming (☞ pg. 12); if the correct preset position number is displayed in step **3**, this confirms that the Guide Program number for the PlusCode number you enter in step **2** has been set correctly.

A If both auto channel set and auto clock set have been performed successfully:

1 Turn on the TV and select its VIDEO channel or AV mode, then make sure that all necessary stations have been stored in the recorder's memory by using the **TV PROG** button(s).
- If station names (ID — ☞ pg. 35) have also been stored in the recorder's memory, the station name will be displayed at the top left corner of the screen for about 5 seconds each time the recorder is tuned to a different station.
- If you want to set the tuner manually such as to add or skip channels, to change preset positions, or to set or change station names, see pages 32 – 34.

Now you have finished the basic set up and can use your recorder for both playback and recording.

B If auto channel set has succeeded but auto clock set has not:

1 Turn on the TV and select its VIDEO channel or AV mode, then make sure that all necessary stations have been stored in the recorder's memory by using the **TV PROG** button(s).
- If station names (ID — ☞ pg. 35) have also been stored in the recorder's memory, the station name will be displayed at the top left corner of the screen for about 5 seconds each time the recorder is tuned to a different station.
- If you want to set the tuner manually such as to add or skip channels, to change preset positions, or to set or change station names, see pages 32 – 34.

2 Perform "Clock Set" on page 37.

Now you have finished the basic set up and can use your recorder for both playback and recording.

C If both auto channel set and auto clock set have failed:

1 Make sure the TV aerial cable is connected properly to the recorder and turn off the recorder power once, then turn the recorder power back on again.
- The recorder will try Auto Set Up again.

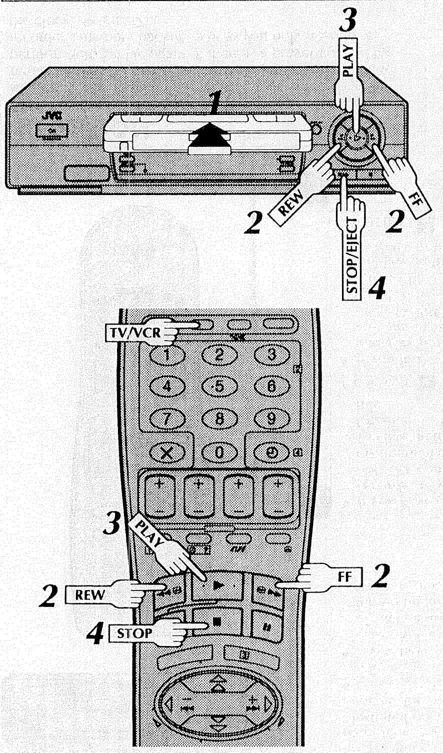
IMPORTANT

- In certain reception conditions, station names may not be stored correctly, and auto Guide Program Number Set may not work properly. If the Guide Program numbers are not set properly, when you timer-record a TV programme using VIDEO Plus+, the recorder will record a TV programme of a different station. When programming the timer using VIDEO Plus+, be sure to check that the preset position corresponding to the broadcasting station you wish to record has been selected (☞ pg. 12, "VIDEO Plus+ Timer Programming").
- Your video recorder memorizes all detected stations even if reception of some of them is poor. In these cases picture quality may be poor. To delete those stations which have an unacceptable picture ☞ "Delete A Channel" on page 33.
- If any of the above problems occur, refer to pages 32 – 34 to input station names (☞ "Set Stations") or delete unnecessary stations (☞ "Delete A Channel"). You can also change station preset positions (☞ "Change Station Preset Position").
- **For RF connection users:** In certain reception conditions, the Video Channel may not be set correctly and interference may appear in the TV picture while the recorder's power is on. Set your Video Channel manually. ☞ pg. 28, "Video Channel Set".

If you have any difficulty with the above procedures call the JVC Customer Service Hot Line on 0181 208 7654

Playback

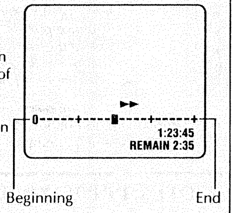
Turn on the TV and select the VIDEO channel (or AV mode).



Tape Position Indicator

The tape position indicator appears on screen when, from the Stop mode, you press **FF**, **REW** or perform an Index Search. The position of "▮" in relation to "0" (beginning) or "+" (end) shows you where you are on the tape.

"O.S.D." (☞ pg. 25) must be set to "ON", or the indicator will not appear.



NOTE:

Depending on the type of tape used, there may be times when the indication is not correct.

The easiest, most basic operation possible with your video recorder is tape playback. Already-recorded signals on a video tape are read by your video recorder and displayed on your TV just like a TV programme.

1 LOAD A CASSETTE

Make sure the window side is up, the rear label side is facing you and the arrow on the front of the cassette is point toward the recorder. Don't apply too much pressure when inserting.

- The recorder power comes on automatically and the counter is reset to 0:00:00.
- If the record safety tab has been removed, playback begins automatically.

2 FIND PROGRAMME START POINT

If the tape is advanced past the start point, press **REW**. To go forward, press **FF**.

3 START PLAYBACK

Press **PLAY**. "BEST" appears blinking in the recorder's display panel during automatic tracking (☞ pg. 18).

- Playback picture quality of LP recordings will not be as high as SP recordings.

4 STOP PLAYBACK

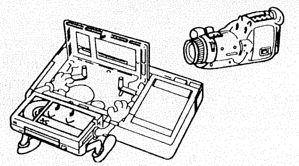
Press **STOP** on the remote or **STOP/EJECT** on the recorder's front panel. Then press **STOP/EJECT** to remove the cassette.

INFORMATION

When using the AV connection (☞ pg. 5), initiating playback causes the VCR indicator to light and the TV to automatically enter AV mode. To return the TV to TV mode after playback is complete, press **TV/VCR** so that the VCR indicator turns off.

* Depending on the type of TV used, **TV/VCR** button does not function as described above.

Usable cassettes

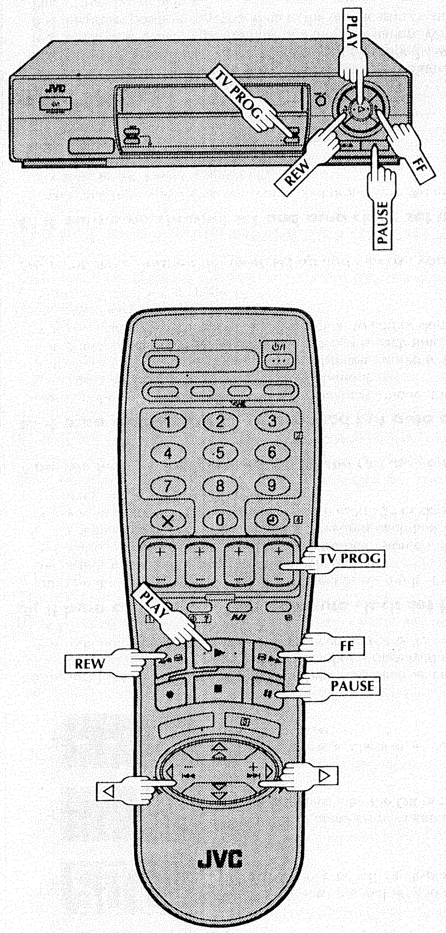


- Compact VHS camcorder recordings can be played on this video recorder. Simply place the recorded cassette into a VHS Cassette Adapter and it can be used just like any full-sized VHS cassette.
- This video recorder can record on regular VHS and Super VHS cassettes. However, it will record and play back regular VHS signals only. It is not possible to play back a recorded Super VHS tape.

ATTENTION

In the search, still, slow-motion or frame-by-frame playback mode,

- the picture will be distorted.
- noise bars will appear.
- there will be loss of colour with a tape recorded in LP mode.
- Please note that on models HR-J265/260EK/265ES the picture may be distorted in these modes.



High-Speed Search

1 ACTIVATE HIGH-SPEED SEARCH

During playback or still picture, press **FF** for forward high-speed search, or **REW** for reverse high-speed search.

To resume normal playback, press **PLAY**.

NOTE:

*For short searches, press and hold **FF** or **REW** for more than 2 seconds during playback or still picture. When released, normal playback resumes.*

Still Picture/Frame-By-Frame Playback

1 PAUSE DURING PLAYBACK

Press **PAUSE**. If there is vertical jitter, use the **TV PROG** buttons to correct the picture.

2 ACTIVATE FRAME-BY-FRAME PLAYBACK

Press **PAUSE**. Each time **PAUSE** is pressed the tape will advance one frame.

OR

Press ◁ or ▷ (⏮ or ⏭). Each time one of these buttons is pressed the tape will move one frame in the direction of the arrow.

To resume normal playback, press **PLAY**.

Slow Motion

1 ACTIVATE SLOW-MOTION PLAYBACK

During still picture, press and hold **PAUSE** for 2 seconds, then release. Press and release again to return to still picture.

OR

During still picture, press and hold ◁ or ▷ (⏮ or ⏭). Release to return to still picture.

To resume normal playback, press **PLAY**.

Variable-Speed Search

1 ACTIVATE VARIABLE-SPEED SEARCH

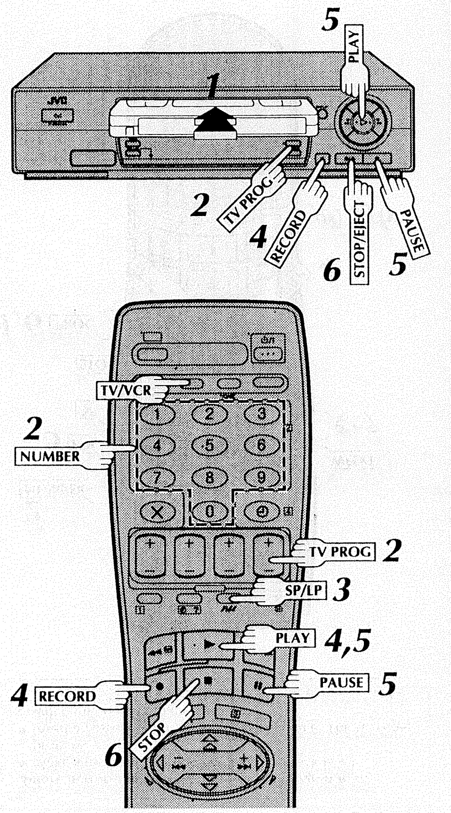
During playback, press ◁ or ▷ (⏮ or ⏭).

- The more times you press, the faster the playback picture moves.
- To decrease speed, press the button for the opposite direction.

To resume normal playback, press **PLAY**.

Recording

Turn on the TV and select the VIDEO channel (or AV mode).



INFORMATION

When using the AV connection (☞ pg. 5), you can switch between TV mode and AV mode by pressing **TV/VCR**.

* Depending on the type of TV used, **TV/VCR** button does not function as described above.

Recording Resume Function

If there is a power outage during recording (or Instant Timer Recording or timer recording), the recording will resume automatically when power is restored to the recorder unless the recorder's memory backup has expired.

TV signals being received by the recorder's built-in tuner can be recorded onto a video tape. You can "capture" a TV programme using your video recorder.

1

LOAD A CASSETTE

Insert a cassette with the record safety tab intact (See below).

- The counter is reset to 0:00:00 and the recorder power comes on automatically.

2

CHOOSE A PROGRAMME

Press **TV PROG +/–** or the **NUMBER** keys to select the preset you wish to record.

3

SET TAPE SPEED

Press **SP/LP (////)**. Check the SP/LP indicator on the recorder display panel to confirm the selected tape speed.

- Picture quality of LP recordings will not be as high as on SP recordings.

4

START RECORDING

Press and hold **RECORD** and press **PLAY** on the remote control, or press **RECORD** on the recorder.

B.E.S.T. takes place at the beginning of both the first SP and the first LP recording after inserting the cassette (☞ pg. 18).

- You can not change the preset whilst recording is in progress. To change the preset, see step **5**.

5

PAUSE/RESUME RECORDING

Press **PAUSE**. Press **PLAY** to resume recording.

- During the Record Pause mode, you can change the preset by pressing the **TV PROG +/–** buttons or the **NUMBER** keys.

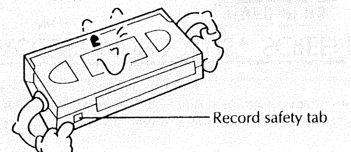
6

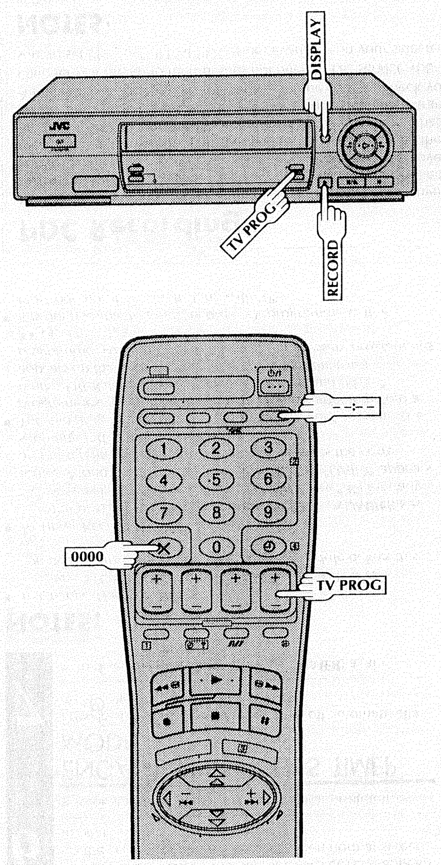
STOP RECORDING

Press **STOP** on the remote control or **STOP/EJECT** on the recorder. Then press **STOP/EJECT** to remove the cassette.

Accidental erasure prevention

- To prevent accidental recording on a recorded cassette, remove its safety tab. To record on it later, cover the hole with adhesive tape.





Tape Remaining Time

1

DISPLAY REMAINING TIME

Press **DISPLAY** (or – –:– –) until the time remaining on the tape appears.

- The display panel shows the tape remaining time with "◣" displayed.
- By pressing the **DISPLAY** (or – –:– –) button, you can change the display to show the counter reading, preset position*, clock time or tape remaining time.

  ** Preset position is not displayed during playback.*

NOTE:

Depending on the type of tape used, there may be times when the tape remaining time reading may not appear right away, or is not correct. "– –:– –" may sometimes appear, or the display may blink on occasion.

Record One Programme While Watching Another

1

SELECT PRESET TO WATCH

Once recording is in progress, all you need to do is to set the preset controls on the TV for the station you wish to view.

- The programme selected with the TV's preset controls appears on the TV screen while the one selected with the recorder's **TV PROG** buttons is recorded on the tape.

Elapsed Recording Time Indication

You can check the exact time of a recording.

1

SET COUNTER DISPLAY

Press **DISPLAY** (or – –:– –) until a counter reading appears on the dispay panel.

2

RESET COUNTER

Press **0000** before starting recording or playback.

- The counter is reset to "0:00:00" and shows the exact elapsed time as the tape runs.

Instant Timer Recording (ITR)

This easy method allows you to record for any length of time from 30 mins. to 6 hours (selectable in 30-min. increments), and shuts off the recorder after recording is finished.

1

START RECORDING

Press **RECORD** on the recorder.

2

ENGAGE ITR MODE

Press **RECORD** again. "◷" blinks and "0:30" appears on the front display panel.

3

SET RECORDING DURATION

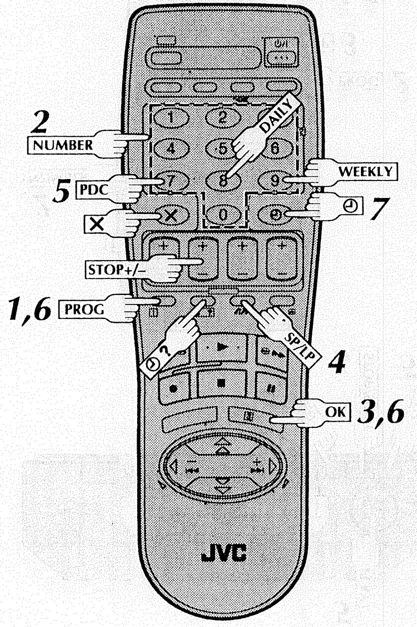
If you want to record for more than 30 minutes, press **RECORD** to extend the time. Each press extends recording time by 30 minutes.

NOTE:

*You can only perform ITR using the **RECORD** button on the recorder's front panel.*

VIDEO Plus+ Timer Programming

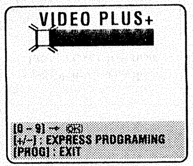
Before performing VIDEO Plus+ Timer Programming:
- Make sure that the recorder's built-in clock is set properly.
- Insert a cassette with the safety tab in place. The recorder will come on automatically.
- Turn on the TV and select the VIDEO channel (or AV mode).



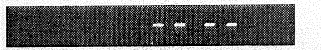
With VIDEO Plus+, timer programming is greatly simplified because each TV programme has a corresponding code number which your recorder is able to recognise.

1 ACCESS VIDEO PLUS+ SCREEN

Press **PROG**.



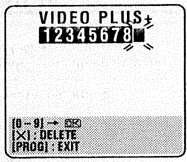
The front display panel looks like this:



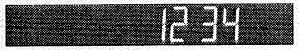
2 ENTER PLUSCODE NUMBER

Press the **NUMBER** keys to enter the PlusCode number of the programme you wish to record.

- If you make a mistake, press X and input the correct number.



The PlusCode number you enter appears on the front display panel:

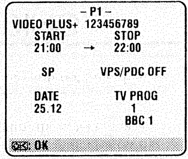


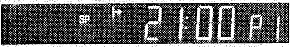
The display panel shows only a 4-digit number.

3 ACCESS VIDEO PLUS+ PROGRAM SCREEN

Press **OK**, and the VIDEO Plus+ Program screen appears (if you're just starting out, "P1" appears).

The display panel shows the programme start time. Pressing ⊕ **?** changes the display to the programme stop time, then the date and preset position.





IMPORTANT
Make sure the preset position number you wish to record is displayed; if not, see "VIDEO Plus+ Setup" on page 38 and set the Guide Program number for that PlusCode number correctly.

- If the number you entered is invalid, "ERROR" appears on the screen and "Err" appears on the display panel. Press X and input a valid PlusCode number.
- If the "GUIDE PROG SET" screen appears, see "ATTENTION – Regarding Guide Program Number Set" on page 13.

4 SET TAPE SPEED

Press **SP/LP (/////)** to set the tape speed.

5 SET PDC MODE

Press **PDC** to select "ON" or "OFF".
If "VPS/PDC ON" is displayed on the screen or "VPS/PDC" is lit on the display panel, PDC is set to ON.
If "VPS/PDC OFF" is displayed on the screen or "VPS/PDC" is not lit on the display panel, PDC is set to OFF.
☞ "PDC Recording" in the column below.

- VPS (Video Programme System) recording is not currently available in the U.K. and not possible with this recorder.

6 RETURN TO NORMAL SCREEN

Press **PROG** or **OK**. "PROGRAM COMPLETED" appears on the screen for about 5 seconds, then normal screen appears.

- Repeat steps **1** – **6** for each additional programme.

7 ENGAGE RECORDER'S TIMER MODE

Press ⊕ (**TIMER**). The recorder turns off automatically and ⊕ appears on the display panel.

- To disengage the timer, press ⊕ (**TIMER**) again.

NOTES:

- *To Change The Stop Time . . .*
  *. . . press **STOP +/–** after pressing **OK** in step **3**. You can compensate for anticipated programme schedule delays this way.*
- *To Timer-Record Weekly Or Daily Serials . . .*
  *. . . after pressing **OK** in step **3**, press **WEEKLY** (**NUMBER** key "9") for weekly serials or **DAILY** (**NUMBER** key "8") for daily serials (Monday – Friday). Either "WEEKLY" or "DAILY" appears on the screen. Pressing the button again makes the corresponding indication disappear.*
- *You can programme this recorder to timer-record as many as 8 programmes. If you try to programme the recorder to record a ninth, "PROGRAM FULL" appears on screen and "FULL" appears on the front display panel. To record the extra programme, you must first cancel any unnecessary programmes (☞ pg. 16).*
- *It is not possible to timer-record a TV programme with a PlusCode number which starts with "0".*

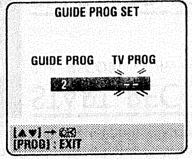
Satellite Receiver Users
To timer-record a satellite broadcast using VIDEO Plus+:
1. Perform steps **1** – **7**.
2. Set the satellite receiver to the appropriate channel before the selected programme begins.
3. Leave the satellite receiver's power on.

ATTENTION

Regarding Guide Program Number Set

"GUIDE PROG SET" appears after performing step **3** if the Guide Program number for the PlusCode number you entered has not been set.

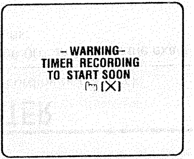
- Press the **NUMBER** keys or △▽ to input the preset position number on which your recorder receives that station, then press **OK** or ▷ to set the Guide Program number. The VIDEO Plus+ Program screen appears.



(Ex.) To timer-record a BBC2 programme with VIDEO Plus+.
* If your recorder receives BBC2 on the preset position 2, press **OK** or ▷ after entering "2".

Timer Warning

If you have programmed your recorder to timer-record a programme or a series of programmes, a warning appears on the screen to tell you that the recording is due to start in 5 minutes.



NOTES:

- *The warning only appears if you're not in the Timer mode at the time.*
- *If this recorder is being used as the player for tape dubbing, the warning screen will be recorded on the tape in the other video recorder.*

The warning blinks for the entire 5 minutes leading up to the start of timer recording. To clear the display, press X.

PDC Recording

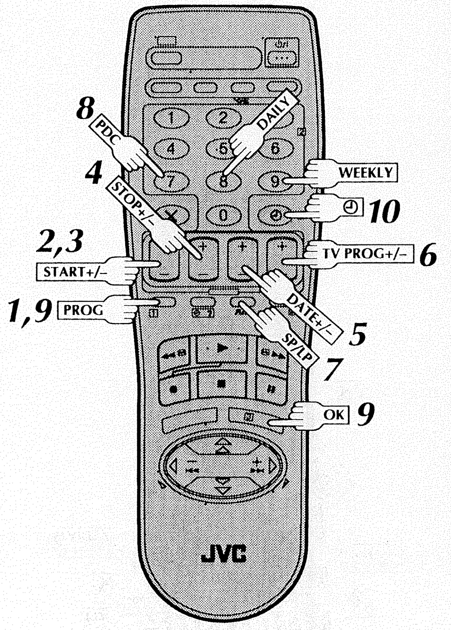
Now available from some TV stations, PDC (Programme Delivery Control) is a service designed to assure safe, accurate timer recording. With this system, special code signals are transmitted together with the audio/video signals. These code signals control your video recorder and have precedence over the advertised times which you may have preset into the timer. This means that your recorder will start and stop recording when the preset TV programmes actually start and end — even if the broadcast time of a preset TV programme is changed from what has been advertised. PDC is currently available nationally on BBC1, BBC2, Ch.4 and Ch.5, except from a few small relay transmitters. Ch.3 operates a PDC service only in a very few areas. All channels intend to offer this service in due course. Check your TV programme listing guide for latest information. If the channel you intend to record does not offer a PDC service your recorder will not start recording if PDC has been selected. Be sure to set PDC to "OFF" if PDC is not available on your selected channel (☞ step **5** above).

NOTES:

- *PDC recording is also possible when a satellite receiver or a cable system is connected to AV2 IN on your recorder.*
- *PDC recording is also possible via the AV1 IN/OUT connector.*

Express Timer Programming

Before performing Express Timer Programming:
- Make sure that the recorder's built-in clock is set properly.
- Insert a cassette with the safety tab in place. The recorder will come on automatically.
- Turn on the TV and select the VIDEO channel (or AV mode).



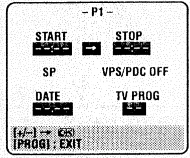
If you don't know the PlusCode number for the programme you wish to record, use the following procedure to set your recorder to timer-record the programme.

1 ACCESS VIDEO PLUS+ SCREEN

Press **PROG**.

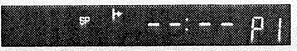
2 ACCESS PROGRAMME SCREEN

Press **START +/–**. (If you're just starting out, "P1" appears.)



- P1 -
START --:-- → STOP --:--
SP VPS/PDC OFF
DATE --.-- TV PROG --
[+/–] → OK
[PROG] : EXIT

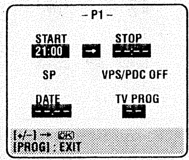
The front display panel looks like this:



3 ENTER PROGRAMME START TIME

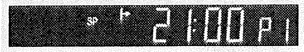
Press **START +/–** to enter the time you want recording to start.

- Press and hold **START +/–** to move in 30-minute increments, or press and release repeatedly to move 1 minute at a time.



- P1 -
START 21:00 → STOP --:--
SP VPS/PDC OFF
DATE --.-- TV PROG --
[+/–] → OK
[PROG] : EXIT

The front display panel looks like this:



4 ENTER PROGRAMME STOP TIME

Press **STOP +/–** to enter the time you want recording to stop.

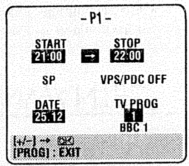
- Press and hold **STOP +/–** to move in 30-minute increments, or press and release repeatedly to move 1 minute at a time.

5 ENTER PROGRAMME DATE

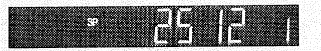
Press **DATE +/–** to enter the date on which you wish to record. (The current date first appears on screen. The date you enter will appear in its place.)

6 ENTER PRESET POSITION

Press **TV PROG +/–** to enter the preset position corresponding to the broadcasting station you wish to record.



- P1 -
START 21:00 → STOP 22:00
SP VPS/PDC OFF
DATE 25.12 TV PROG 1
BBC 1
[+/–] → OK
[PROG] : EXIT



7 SET TAPE SPEED

Press **SP/LP (▰▰▰)** to set the tape speed.

8 SET PDC MODE

Press **PDC** to select "ON" or "OFF".
If "VPS/PDC ON" is displayed on the screen or "VPS/PDC" is lit on the display panel, PDC is set to ON.
If "VPS/PDC OFF" is displayed on the screen or "VPS/PDC" is not lit on the display panel, PDC is set to OFF.
☞ "PDC Recording" in the right column.

- VPS (Video Programme System) recording is not currently available in the U.K. and not possible with this recorder.

9 RETURN TO NORMAL SCREEN

After confirming all information is correct, press **PROG** or **OK**. "PROGRAM COMPLETED" appears on the screen for about 5 seconds, then normal screen appears.

- Repeat steps **1** – **9** for each additional programme.

10 ENGAGE RECORDER'S TIMER MODE

Press ⊕ (**TIMER**). The recorder turns off automatically and ⊕ appears on the display panel.

- To disengage the timer, press ⊕ (**TIMER**) again.

To Timer-Record Weekly Or Daily Serials . . .
. . . anytime during steps **2** through **9**, press **WEEKLY** (**NUMBER** key "9") for weekly serials or **DAILY** (**NUMBER** key "8") for daily serials (Monday – Friday). Either "WEEKLY" or "DAILY" appears on the screen. Pressing the button again makes the corresponding indication disappear.

NOTE:

You can programme this recorder to timer-record as many as 8 programmes. If you try to programme the recorder to record a ninth, "PROGRAM FULL" appears on screen and "FULL" appears on the front display panel. To record the extra programme, you must first cancel any unnecessary programmes (☞ pg. 16).

Satellite Receiver Users
To timer-record a satellite broadcast using Express Timer Programming:
1. Perform steps **1** – **10**. Enter "L-2" for the preset position in step **6**.
2. Set the satellite receiver to the appropriate channel before the selected programme begins.
3. Leave the satellite receiver's power on.

PDC Recording

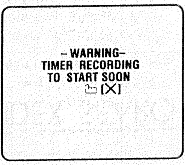
Now available from some TV stations, PDC (Programme Delivery Control) is a service designed to assure safe, accurate timer recording. With this system, special code signals are transmitted together with the audio/video signals. These code signals control your video recorder and have precedence over the advertised times which you may have preset into the timer. This means that your recorder will start and stop recording when the preset TV programmes actually start and end — even if the broadcast time of a preset TV programme is changed from what has been advertised. PDC is currently available nationally on BBC1, BBC2, Ch.4 and Ch.5, except from a few small relay transmitters. Ch.3 operates a PDC service only in a very few areas. All channels intend to offer this service in due course. Check your TV programme listing guide for latest information. If the channel you intend to record does not offer a PDC service your recorder will not start recording if PDC has been selected. Be sure to set PDC to "OFF" if PDC is not available on your selected channel.
(☞ step **8** in the left column).

NOTES:

- *Set the start time (PDC time) exactly as advertised in the TV listing. A different time than advertised will result in no recording.*
- *PDC recording is also possible when a satellite receiver or a cable system is connected to AV2 IN/DECODER on your recorder.*
- *PDC recording is also possible via the AV1 IN/OUT connector.*

Timer Warning

If you have programmed your recorder to timer-record a programme or a series of programmes, a warning appears on the screen to tell you that the recording is due to start in 5 minutes.

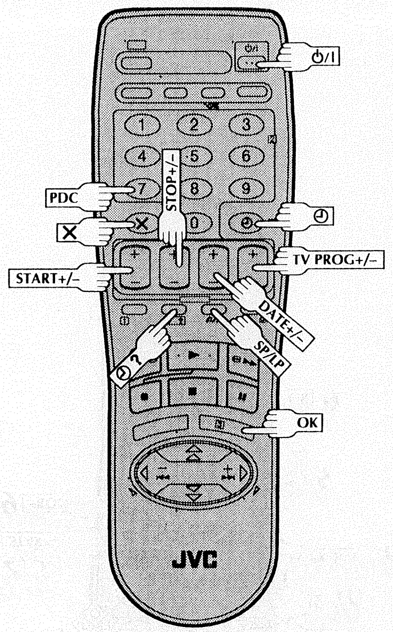


- WARNING -
TIMER RECORDING
TO START SOON
[X]

NOTES:

- *The warning only appears if you're not in the Timer mode at the time.*
- *If this recorder is being used as the player for tape dubbing, the warning screen will be recorded on the tape in the other video recorder.*

The warning blinks for the entire 5 minutes leading up to the start of timer recording. To clear the display, press X.



Check, Cancel And Replace Programmes

1

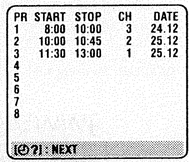
DISENGAGE TIMER MODE

Press ⊕, then press ⏻/I.

2

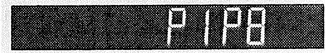
ACCESS PROGRAMME CHECK SCREEN/DISPLAY

Press ⊕ ?.



PR	START	STOP	CH	DATE
1	8:00	10:00	3	24.12
2	10:00	10:45	2	25.12
3	11:30	13:00	1	25.12
4				
5				
6				
7				
8				

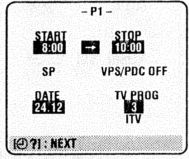
[⊕ ?] : NEXT



3

ACCESS PROGRAMME SCREEN/DISPLAY

Press ⊕ ? again to check more information. Each time you press ⊕ ?, the next programme's information appears.



– P1 –

START 8:00 → STOP 10:00

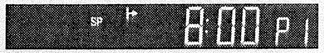
SP

VPS/PDC OFF

DATE 24.12

TV PROG 3 ITV

[⊕ ?] : NEXT



- The display panel shows the programme start time. Pressing **OK** changes the display to the programme stop time, then the date and the preset position.

To cancel or replace a programme...

4

CANCEL OR REPLACE A PROGRAMME

Press X to cancel a programme. To replace a programme, press the appropriate button: **START+/–**, **STOP+/–**, **DATE+/–**, **TV PROG+/–**, **SP/LP** (**////**), **PDC**.

5

RETURN TO NORMAL SCREEN/DISPLAY

Press ⊕ ? as many times as necessary. If there are still some programmes to be recorded, go on to step **6**.

6

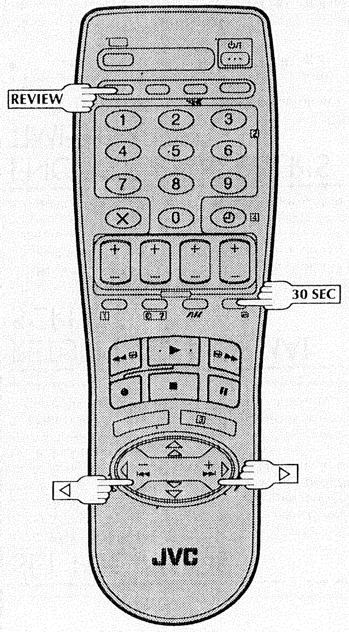
RETURN TO TIMER MODE

Press ⊕.

NOTE:

You can also check the programmes on the display panel even when the recorder's power is off or the recorder is in the Timer mode. However, it is not possible to cancel or replace the programmes.

Looking For The Scene You Want



Skip Search

1

SKIP OVER UNWANTED SECTIONS

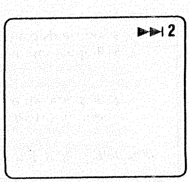
Press **30 SEC** 1 to 4 times during playback. Each press initiates a 30-second period of fast-motion playback. Normal playback resumes automatically.

NOTE:

To return to normal playback during a Skip Search, press **PLAY**.

Index Search

Your recorder automatically marks index codes at the beginning of each recording. This function gives you quick access to any one of 9 index codes in either direction.



NOTE:

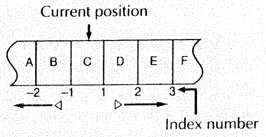
Before starting, make sure the recorder is in the Stop mode.

1

ACTIVATE INDEX SEARCH

Press ◁ or ▷ (I◄◄ or ►►I). "I◄◄ 1" or "►►I 1" is displayed on screen and search begins in the corresponding direction.

- To access index codes 2 through 9, press ◁ or ▷ repeatedly until the correct index number is displayed.
  Ex.: To locate the beginning of B from the current position, press ◁ twice.
  To locate the beginning of D from the current position, press ▷ once.



- When the specified index code is located, playback begins automatically.

Instant ReView

Simply by pressing a single button, the recorder power comes on, rewinds, and begins playback of the last timer-recorded programme. If you have several programmes recorded, you can easily access any of them.

NOTE:

Before starting, make sure that the recorder is off and that the Timer mode is disengaged.

1

ACTIVATE INSTANT REVIEW

Press **REVIEW**. The recorder power comes on and the recorder searches for the index code indicating the start of the last timer-recorded programme. Once it's found, playback begins automatically.

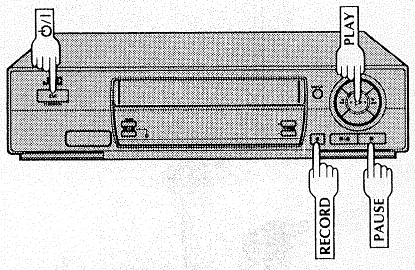
- The front display panel tells you how many programmes have been timer-recorded. If you have, for example, 3 programmes, "REVIEW" and "3" appear and blink. To watch the first of the 3 programmes, press **REVIEW** three times. The recorder searches and begins playback automatically. You can access a programme as far as 9 index codes away from the current tape position.

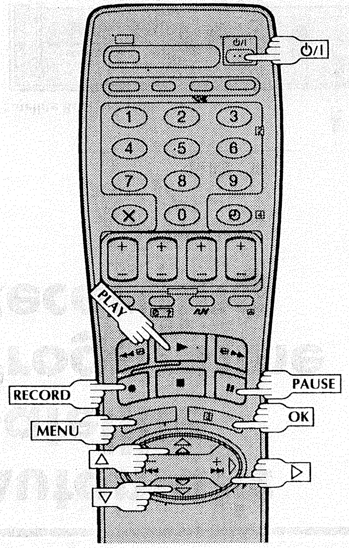
NOTES:

- *Instant ReView is not possible while the recorder is in the Timer mode.*
- *The number of recorded programmes will not be displayed on the front display panel after Auto Satellite Prog recording (☞ pg. 20).*

Playback/ Recording According To Tape Characteristics

Turn on the TV and select the VIDEO channel (or AV mode).





B.E.S.T. Picture System

The B.E.S.T. (Biconditional Equalised Signal Tracking) system checks the condition of the tape in use during recording and playback, and compensates to provide the highest-possible recording and playback pictures. The default setting for both recording and playback is "ON".

1

TURN ON THE RECORDER

Press ⏻/I.

2

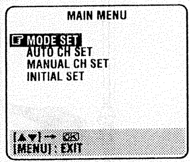
ACCESS MAIN MENU SCREEN

Press **MENU**.

3

ACCESS MODE SET SCREEN

Press △▽ to move the highlight bar (pointer) to "MODE SET", then press **OK** or ▷.



MAIN MENU

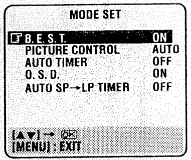
☞ MODE SET
AUTO CH SET
MANUAL CH SET
INITIAL SET

[▲▼] → OK
[MENU] : EXIT

4

SELECT B.E.S.T. MODE

Press △▽ to move the highlight bar (pointer) to "B.E.S.T.", then press **OK** or ▷ to set to "ON" or "OFF".



MODE SET

☞ B.E.S.T.	ON
PICTURE CONTROL	AUTO
AUTO TIMER	OFF
O. S. D.	ON
AUTO SP→LP TIMER	OFF

[▲▼] → OK
[MENU] : EXIT

5

RETURN TO NORMAL SCREEN

Press **MENU**.

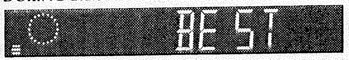
Recording

1

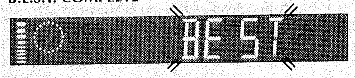
START RECORDING

Press and hold **RECORD** and press **PLAY** on the remote, or press **RECORD** on the recorder.

DURING B.E.S.T.



B.E.S.T. COMPLETE



- The recorder spends approximately 7 seconds assessing the condition of the tape, then begins recording.

NOTES:

- *The B.E.S.T. system works for both SP and LP modes only after a tape has been inserted and the Record mode is first initiated. It does not work during recording.*
- *The B.E.S.T. system does not work while Auto Satellite Prog recording is in progress (☞ pg. 20).*
- *In the case of timer recording, the B.E.S.T. system works before recording is initiated.*
- *Once the cassette is ejected, the B.E.S.T. data is cancelled. The next time the cassette is used for recording, B.E.S.T. is re-performed.*
- *Pressing the recorder's **RECORD** button while "BEST" is displayed does not start Instant Timer Recording (☞ pg. 11).*

ATTENTION

*Since the B.E.S.T. system works before recording actually starts, there is a delay of approximately 7 seconds after **RECORD** and **PLAY** on the remote are pressed, or **RECORD** on the recorder is pressed. To make sure you record the desired scene or programme in its entirety, first perform the following steps:*

*1) Press and hold **PAUSE** and press **RECORD** to engage the RECORD PAUSE mode.*
  - *The recorder then automatically checks the condition of the tape and, after approximately 7 seconds, re-enters RECORD PAUSE.*

*2) Press **PLAY** when you are ready to start recording.*
  - *If you want to bypass the B.E.S.T. system and begin recording immediately, set "B.E.S.T." to "OFF" in step **4** on page 18.*

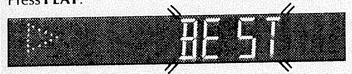
Playback

The recorder assesses the quality of the tape once you initiate playback.

1

START PLAYBACK

Press **PLAY**.



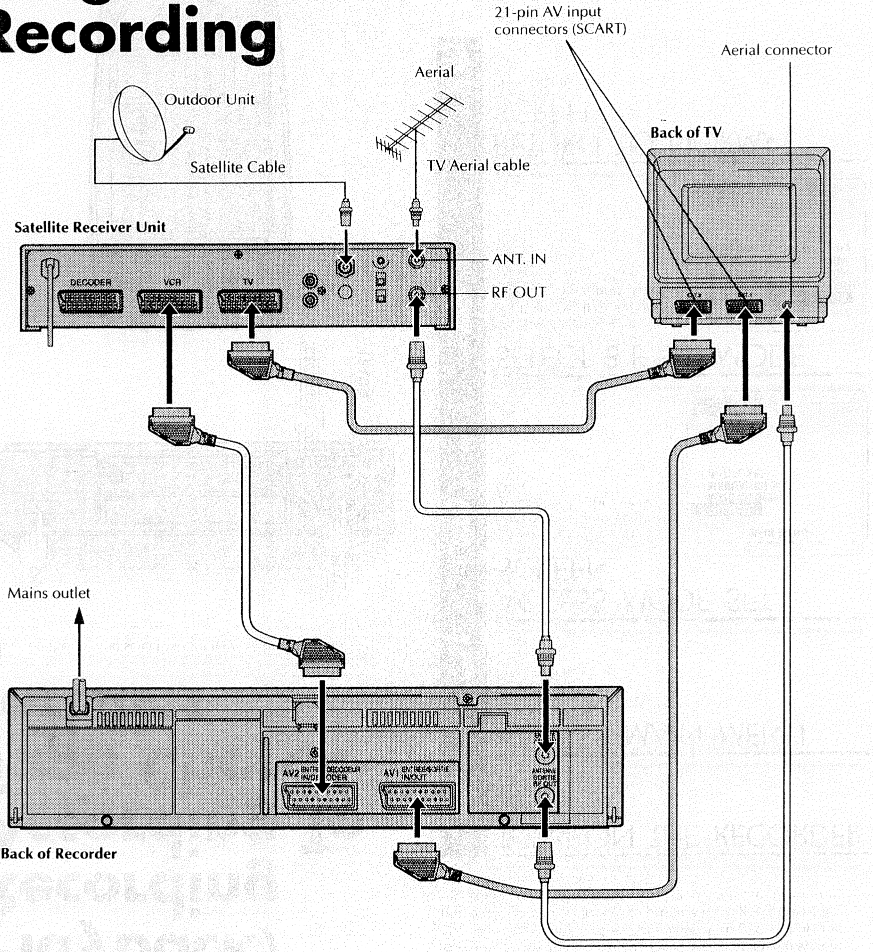
- The recorder adjusts the playback picture quality based on the quality of the tape in use.
- B.E.S.T. is active during Auto Tracking. "BEST" appears blinking on the recorder's display panel.

NOTES:

- *When watching a tape recorded with "B.E.S.T." set to "ON", it is recommended that you leave B.E.S.T. on during playback as well.*
- *When watching a rental tape or one recorded on another video recorder, or when using this recorder as the player for editing, set B.E.S.T. to your preference by performing steps **1** through **5** on page 18.*
- *"BEST" only appears at the beginning of automatic tracking. Even though it doesn't appear after that, the B.E.S.T. function is operative.*

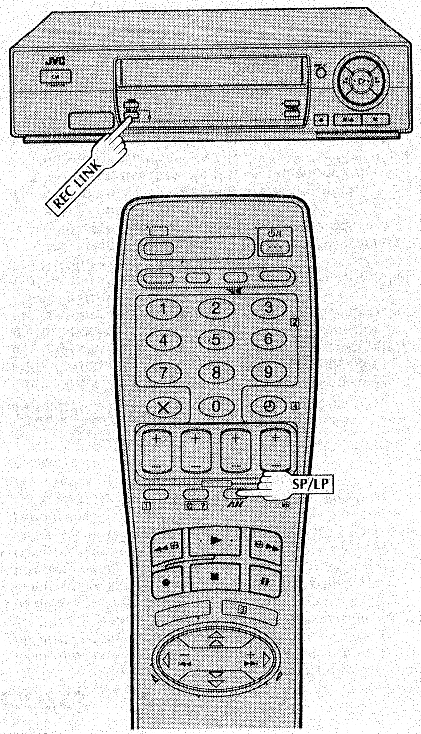
Automatic Satellite Programme Recording

This facility allows you to record automatically a satellite programme which is timer-programmed on your external satellite receiver. Connect a satellite receiver to the recorder's AV2 IN/DECODER connector and programme the timer on the satellite receiver; the recorder starts recording when the signals input from the satellite receiver to the AV2 IN/DECODER connector, and when there is no input signals the recorder stops recording and the power shuts off.



NOTES:

- When connecting your recorder to a TV equipped with 21-pin AV input connectors (SCART), follow the illustration above using the cables shown in grey.
- For details, check your satellite receiver's instruction manual.



Before performing the following steps:
- Make sure the satellite receiver is connected to the recorder's AV2 IN/DECODER connector. (☞ pg. 20)
- Programme the timer on the satellite receiver.
- Insert a cassette with the safety tab in place.

1 SET TAPE SPEED

Press **SP/LP** (**/////**) on the remote control to set the tape speed.

2 ENGAGE AUTO SATELLITE PROG REC MODE

Press and hold **REC LINK** for about 2 seconds. The indicator lights up and the recorder turns off automatically.

- To disengage the Auto Satellite Prog Rec mode, press **REC LINK**. The indicator goes off.
- If the recorder's power is off, it is not possible to engage the Auto Satellite Prog Rec mode.

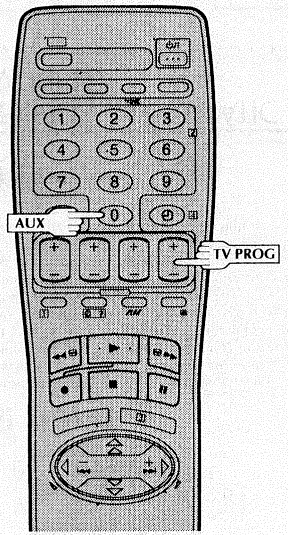
ATTENTION

- Be sure not to turn on the satellite receiver before the programme is executed; otherwise, the recorder will start recording when the satellite receiver's power is turned on.
- If you have connected another appliance other than a satellite receiver to the AV2 IN/DECODER connector, be sure not to engage the Auto Satellite Prog Rec mode; otherwise, the recorder will start recording when the connected appliance's power is turned on.
- Auto Satellite Prog recording and timer-recording cannot be done at the same time.
- When you press and hold the recorder's **REC LINK** button to engage the Auto Satellite Prog Rec mode, if the REC LINK indicator does not light but instead blinks quickly even though your satellite receiver's power is off, Auto Satellite Prog Recording will not work properly with that satellite receiver*.
  If this is the case, perform "Express Timer Programming" (☞ pg.14) to timer-record a satellite programme.
  * *Some satellite receivers output signals even if the power is off. Auto Satellite Prog Recording is not possible with those satellite receivers.*

NOTES:

- *Auto Satellite Prog recording is possible with the AV2 IN/DECODER connector only.*
- *When the Auto Satellite Prog Rec mode is engaged or the recorder's power is turned off after Auto Satellite Prog recording is finished, the recorder will not enter the Timer mode even though "AUTO TIMER" is set to "ON".*
- *After Auto Satellite Prog recording, the number of recorded programmes will not be displayed on the front display panel for the Instant ReView function (☞ pg. 17).*
- *For timer programming of the satellite receiver, refer to the instruction manual of the satellite receiver.*
- *Auto Satellite Prog recording is not possible if your satellite receiver does not have a timer.*
- *The **REC LINK** indicator blinks while Auto Satellite Prog recording is in progress.*
- *Pressing the recorder's ⏻/I button while Auto Satellite Prog recording is in progress turns off the recorder's power and disengages the Auto Satellite Prog Rec mode.*
- *If there is more than one satellite programme you wish to record with Auto Satellite Prog Recording, it is not possible to set a different tape speed for each; the tape speed selected in step **1** will apply to all the programmes for Auto Satellite Prog recording.*
- *The B.E.S.T. system (☞ pg. 18) does not work while Auto Satellite Prog recording is in progress.*
- *Just Clock (☞ pg. 37) does not work when the Auto Satellite Prog Rec mode is engaged.*
- *Depending on the type of satellite receiver, the recorder may not record a short portion at the beginning of the programme or may record slightly longer than the actual length of the programme.*
- *If you engage the Auto Satellite Prog Rec mode when the satellite receiver's power is on, the recorder will not start Auto Satellite Prog recording even though the **REC LINK** indicator blinks. When the satellite receiver shuts off once and is turned back on again, the recorder starts recording.*
- *You can also record a programme from your cable system in the same way if the system has a timer and is connected to the recorder's AV2 IN/DECODER connector.*

Edit To Or From Another Video Recorder



You can use your video recorder as the source player or as the recording deck.

1

MAKE CONNECTIONS

Connect the player's 21-pin SCART connector to the recorder's 21-pin SCART connector as illustrated on the below.

When Using Your Video Recorder As The Source Player . . .
. . . connect its AV1 IN/OUT connector to the recording deck.

When Using Your Video Recorder As The Recording Deck . . .
. . . connect its AV2 IN/DECODER or AV1 IN/OUT connector to the source player.

2

SET RECORDING DECK'S INPUT MODE

Set to AUX. With this video recorder, press **AUX** and/or **TV PROG** to select "L-1" for the AV1 IN/OUT connector, or "L-2" for the AV2 IN/DECODER connector, depending on the connector being used.

3

SET EDIT MODE

See "Picture Control" on page 24.

4

START SOURCE PLAYER

Engage its Play mode.

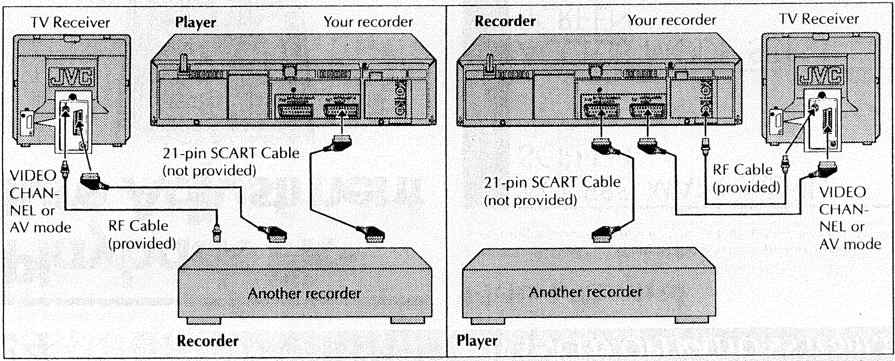
5

START RECORDING DECK

Engage its Record mode.

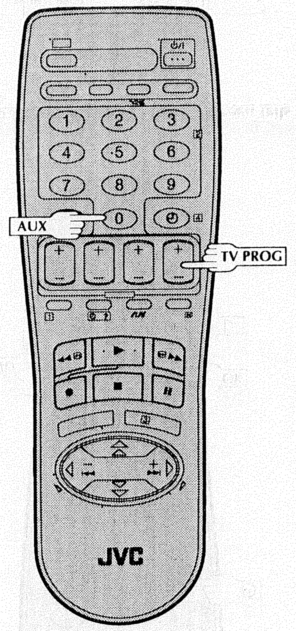
NOTES:

- *All necessary cables can be obtained from your dealer.*
- *When you select EDIT to dub tapes in step 3, be sure to select AUTO (or NORM when B.E.S.T. is set to OFF) after you finish dubbing the tapes.*
- *When you use this recorder as the player for editing, be sure to set "O.S.D." to "OFF" before starting (☞ pg. 25).*


TV Receiver
Player
Your recorder
21-pin SCART Cable (not provided)
VIDEO CHAN-NEL or AV mode
RF Cable (provided)
Another recorder
Recorder
Recorder
Your recorder
TV Receiver
21-pin SCART Cable (not provided)
RF Cable (provided)
VIDEO CHAN-NEL or AV mode
Another recorder
Player

Edit From A Camcorder

You can use a camcorder as the source player and your video recorder as the recorder.


AUX
TV PROG
JVC

1

MAKE CONNECTIONS

Connect the camcorder's AUDIO/VIDEO OUT connectors to the recorder's rear panel AV2 IN or AV1 IN/OUT connector via the optional cable adapter.

2

SET RECORDER'S INPUT MODE

Press **AUX** and/or **TV PROG** to select the appropriate input mode depending on the connector being used; "L-1" for the AV1 IN/OUT connector, or "L-2" for the AV2 IN connector.

3

SET EDIT MODE

See "Picture Control" on page 24.

4

START CAMCORDER

Engage its Play mode.

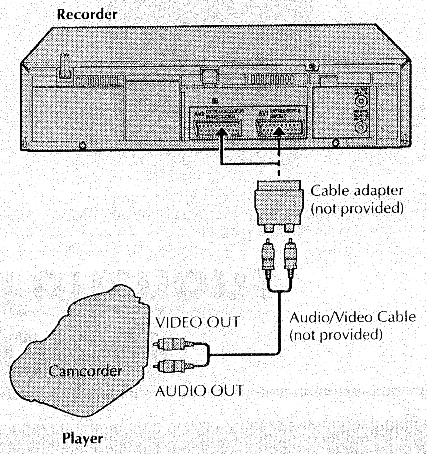
5

START RECORDER

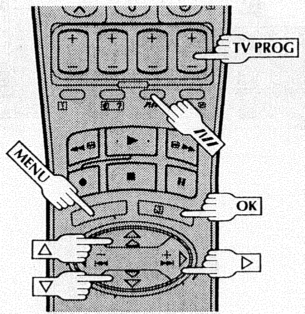
Engage its Record mode.

NOTES:

- *All necessary cables can be obtained from your dealer.*
- *When you select EDIT to dub tapes in step 3, be sure to select AUTO (or NORM when B.E.S.T. is set to OFF) after you finish dubbing the tapes.*

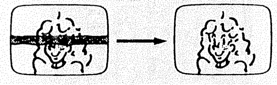

Recorder
Cable adapter (not provided)
VIDEO OUT
Audio/Video Cable (not provided)
Camcorder
AUDIO OUT
Player

Playback Picture Adjustment



Manual Tracking

Your video recorder is equipped with automatic tracking control. For most tapes this will automatically adjust the tracking to suit the particular tape you are playing. In some circumstances it may be necessary to make manual tracking adjustments. This is usually only associated with old or worn tapes or recordings made on old or worn recorders. If the automatic tracking control fails to operate correctly you will see noise bars across the picture as shown on the left below. To correct this you can override the automatic control and adjust the tracking manually by pressing the **TV PROG** buttons.



1 OVERRIDE AUTOMATIC TRACKING

Press **////** on the remote to engage manual tracking.

2 ADJUST TRACKING MANUALLY

Press **TV PROG** + or – to adjust tracking.

3 RETURN TO AUTOMATIC TRACKING

Press **////** on the remote to re-engage automatic tracking.

NOTE:

When a new tape is inserted, the recorder returns to the automatic tracking mode automatically.

Picture Control

This feature helps you to adjust the playback picture quality according to your preference. *The default setting is "AUTO."

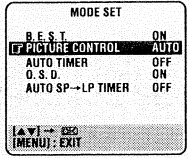
1 ACCESS MAIN MENU SCREEN

Press **MENU**.

2 ACCESS MODE SET SCREEN

Move the highlighted bar (pointer) to "MODE SET" by pressing △▽, then press **OK** or ▷.

3 SELECT PICTURE CONTROL SET MODE



```
            MODE SET

  B. E. S. T.                ON
☞ PICTURE CONTROL           AUTO
  AUTO TIMER                 OFF
  O. S. D.                   ON
  AUTO SP→LP TIMER           OFF

[▲▼] → OK
[MENU] : EXIT
```

Move the highlighted bar (pointer) to "PICTURE CONTROL" by pressing △▽, then press **OK** or ▷ to select the desired mode.

AUTO: Provides optimised picture benefits of B.E.S.T. Picture System. Normally select AUTO.

EDIT: Minimizes picture degradation during editing (recording and playback).

SOFT: Reduces image coarseness when viewing overplayed tapes containing a lot of noise.

SHARP: Clearer, sharper-edged picture when viewing images with lots of flat, same-coloured surfaces such as cartoons.

NOTES:

- *When you select EDIT, SHARP or SOFT, the selected mode will not change until you select again.*
- *When you select EDIT to dub tapes, be sure to select AUTO after you finish dubbing the tapes.*

4 RETURN TO NORMAL SCREEN

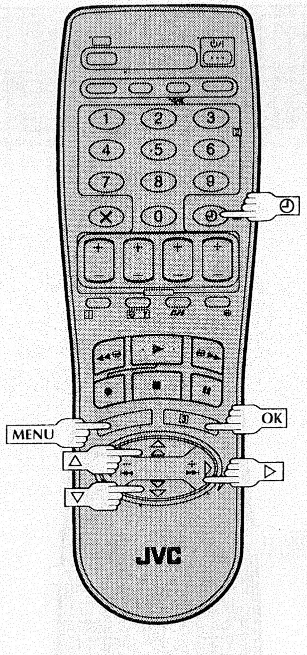
Press **MENU**.

NOTES:

- *When B.E.S.T. is OFF, "PICTURE CONTROL" switches automatically from AUTO to NORM.*
- *Select EDIT when you are dubbing tapes. Refer to page 22.*

Other Functions

Turn on the TV and select the VIDEO channel (or AV mode).



On-Screen Display

You can choose whether or not to have various operational indicators appear on screen, by setting this function ON or OFF.

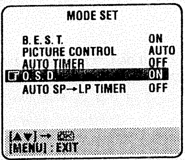
1 ACCESS MAIN MENU SCREEN

Press **MENU**.

2 ACCESS MODE SET SCREEN

Move the highlighted bar (pointer) to "MODE SET" by pressing △▽, then press **OK** or ▷.

3 ENABLE/DISABLE ON-SCREEN DISPLAY



```
            MODE SET

  B. E. S. T.                ON
  PICTURE CONTROL           AUTO
  AUTO TIMER                 OFF
☞ O. S. D.                   ON
  AUTO SP→LP TIMER           OFF

[▲▼] → OK
[MENU] : EXIT
```

The default setting is "ON", so if you want on-screen displays, leave the setting as it is and go to step **4**. If you don't want the displays to appear, press △▽ to move the highlight bar (pointer) to "O.S.D." and press **OK** or ▷ to set "O.S.D." to "OFF".

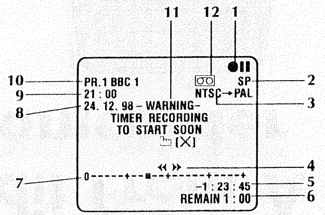
4 RETURN TO NORMAL

Press **MENU**.

NOTES:

- *When you use this recorder as the player for editing, be sure to set "O.S.D." to "OFF" before starting.*
- *During playback, the operation mode indicators may sometimes be disturbed depending on the type of tape being used.*

The superimposed indication on the TV screen tells you what the recorder is doing.



1– Operation mode indicators
2– Tape speed SP/LP/EP (EP is for NTSC playback only)
3– NTSC playback display (☞ pg. 27)
4– Tape direction
5– Counter display
6– Tape remaining time indicator (☞ pg. 11)
7– Tape position indicator (☞ pg. 8)
8– Current day/month/year
9– Clock display
10– Preset position number and station name/Aux. indicator (L-1, L-2 or F-1)
11– Timer warning display (☞ pg. 13, 15)
12– Cassette loaded mark

Auto SP→LP Timer

If, when timer-recording in SP mode, there is not enough tape to record the entire programme, the recorder automatically switches to LP mode to allow complete recording.

For Example . . .
Recording a programme of 210 minutes in length onto a 180-minute tape

Approximately 150 minutes	Approximately 60 minutes
SP mode	LP mode

Total 210 minutes

Make sure you set "AUTO SP→LP TIMER" to "ON" at the Mode Set screen before the timer-recording starts.

1

ACCESS MAIN MENU SCREEN

Press **MENU**.

2

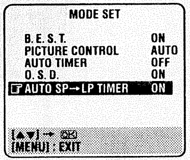
ACCESS MODE SET SCREEN

Press △▽ to move the highlight bar (pointer) to "MODE SET", then press **OK** or ▷.

3

SELECT MODE

Press △▽ to move the highlight bar (pointer) to "AUTO SP→LP TIMER", then press **OK** or ▷ to select "ON".


MODE SET
B. E. S. T. ON
PICTURE CONTROL AUTO
AUTO TIMER OFF
O. S. D. ON
AUTO SP→LP TIMER ON

4

RETURN TO NORMAL SCREEN

Press **MENU**.

NOTES:

- *The Autq SP→LP Timer feature is not available during ITR (Instant Timer Recording), and the feature will not work properly with any tapes longer than E-180 or with some tapes of shorter lengths.*
- *If you have programmed the recorder to timer-record 2 or more programmes, the second programme and those thereafter may not fit on the tape if you set "AUTO SP→LP TIMER" to "ON". In this case, make sure the mode is not engaged, then set the tape speed manually during timer programming.*
- *In order to ensure that the recording fits on the tape, this feature may leave a short non-recorded section at the end of the tape.*
- *There may be some picture noise and sound disturbance at the point on the tape where the recorder switches from SP to LP mode.*
- *If you perform timer recording with both PDC and the Auto SP→LP Timer activated, and the programme goes beyond its originally scheduled length, there may be times when the programme cannot be recorded in its entirety.*

Auto Timer

When the Auto Timer is set to ON the timer is automatically engaged when the recorder power is turned off and automatically disengaged when the recorder is powered back on.

1

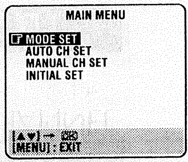
ACCESS MAIN MENU SCREEN

Press **MENU**.

2

ACCESS MODE SET SCREEN

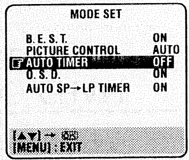
Press △▽ to move the highlight bar (pointer) to "MODE SET", then press **OK** or ▷.



3

SELECT MODE

Press **OK** or ▷ to select either "ON" or "OFF".


MODE SET
B. E. S. T. ON
PICTURE CONTROL AUTO
AUTO TIMER OFF
O. S. D. ON
AUTO SP→LP TIMER ON

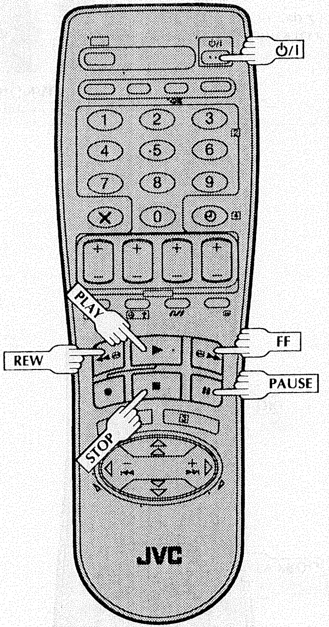
4

RETURN TO NORMAL SCREEN

Press **MENU**.

NOTE:

*For safety, when Auto timer is set to "OFF", all other recorder functions are disabled while the Timer mode is engaged. To disengage the timer, press ◷ (**TIMER**).*

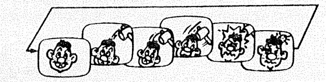


Next Function Memory

The Next Function Memory "tells" the recorder what to do after rewinding. Before continuing, make sure the recorder is in the Stop mode.
a– For Automatic Start Of Playback After Tape Rewind . . .
. . . press **REW**, then press **PLAY** within 2 seconds.
b– For Automatic Power Off After Tape Rewind . . .
. . . press **REW**, then press ⏻/I within 2 seconds.
c– For Automatic Timer Standby After Tape Rewind . . .
. . . press **REW**, then press ◷ (**TIMER**) within 2 seconds.

Repeat Playback

Your video recorder can automatically play back the whole tape 50 times repeatedly.



1

START PLAYBACK

Press **PLAY**.

2

ACTIVATE REPEAT PLAYBACK

Press **PLAY** and hold for over 5 seconds, then release.

- The Play indicator (▷) on the display panel blinks slowly.
- The tape plays 50 times automatically, and then stops.

3

STOP PLAYBACK

Press **STOP** at any time to stop playback.

NOTE:

*Pressing **PLAY**, **REW**, **FF** or **PAUSE** also stops Repeat Playback.*

NTSC Playback

Your video recorder is equipped with NTSC circuitry that can play back NTSC tapes.

1

LOAD A CASSETTE

Insert a cassette recorded in NTSC.

2

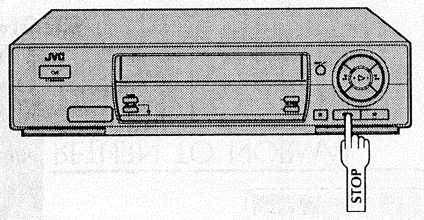
START PLAYBACK

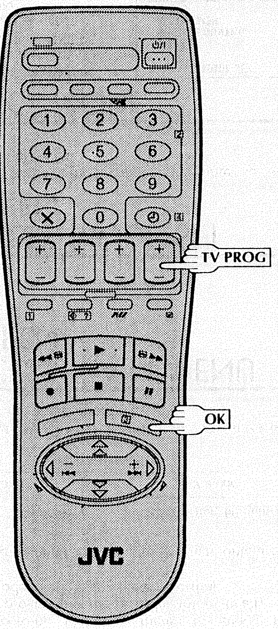
Press **PLAY**.

- "NTSC→PAL" appears on the screen for about 5 seconds.
- Some TVs shrink the picture vertically and place black bars at the top and bottom of the screen. This is not a malfunction on the part of either the video recorder or the TV.
- The picture may roll up and down. This can be corrected using the V-HOLD control found on some TVs. (This cannot be corrected if the TV does not have a V-HOLD control.)
- The counter and tape remaining time readings will be incorrect.
- During search, still, or frame-by-frame playback, the picture will be distorted, and there may be a loss of colour.
- Depending on the type of TV, the top and bottom portions of superimposed displays may be cut off during NTSC playback.

Video Channel Set

Video Channel (RF Output Channel) is the channel on which your TV receives picture and sound signals from the video recorder through the RF cable.





IMPORTANT

Perform the following steps only if —

- Video Channel Set has not been done correctly by the Auto Set Up function (☞ pg. 6).
- interference appears in the TV picture after you have moved to a different area or a new station has started broadcasting in your area.
- you change the connection between your recorder and TV from RF connection to AV connection, or vice versa.

- ***If you have connected the video recorder to your TV via both an RF cable and a 21-pin SCART cable (AV connection), you do not need the video channel so you have to set the video channel to off. — Go to "With AV Connection" below.***
- ***If you have connected the video recorder to your TV via an RF cable only (RF connection), you have to set the correct video channel — Go to "With RF Connection" on page 29.***

With AV Connection

Before performing the following procedure, make sure that:

- the mains power cord is plugged into the mains outlet.
- the video recorder is turned off and there is no cassette inserted in the recorder.
- batteries have been installed in the remote control.

1 ACCESS VIDEO CHANNEL SET MODE

Press and hold down **STOP** on the recorder until the display panel shows the following.

_OUT 22

2 SET VIDEO CHANNEL

Press **TV PROG** – until the display panel shows "_OUT– –".

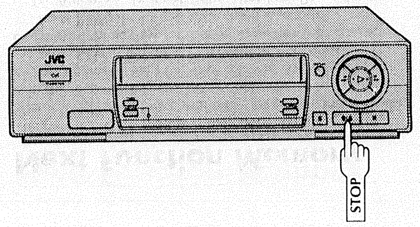
_OUT - -

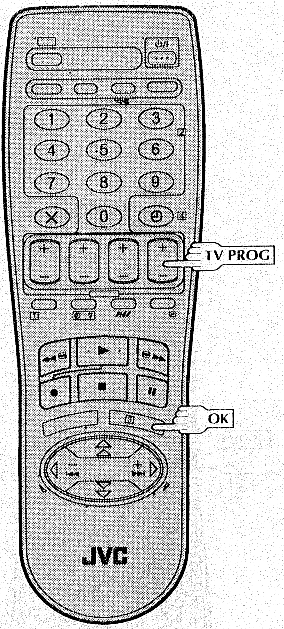
- Now the video channel is set to off.

3 EXIT VIDEO CHANNEL SET MODE

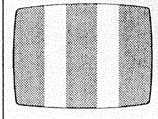
Press **OK**.

To view picture signals from the video recorder, set your TV to its AV mode. Refer to the instructions supplied with your TV set for how to do this.





TEST SIGNAL



The channel on which the screen on the left appears clearly in step **2** is your Video Channel.

With RF Connection

Before performing the following procedure, make sure that:

- the mains power cord is plugged into the mains outlet.
- the video recorder is turned off and there is no cassette inserted in the recorder.
- the connected TV is turned on.
- batteries have been installed in the remote control.

1 ACCESS VIDEO CHANNEL SET MODE

Press and hold down **STOP** on the recorder until the display panel shows the following.

_OUT 22

2 SET VIDEO CHANNEL

Press **TV PROG+** or – to set the video recorder to a vacant channel between 22 and 69 which is not occupied by any local station in your area. Refer to list on page 36 for details of broadcast stations in your area.

(Ex.) If channel 36 is available in your area

_OUT 36

Then set your TV to UHF channel 36. (Refer to the instructions supplied with your TV set for how to do this.)

- If the two vertical white bars appear clearly on the screen as shown in the illustration at bottom left, go to step **3**.
- If the two vertical white bars do not appear clearly, re-set the video recorder to another vacant channel and try again.

IMPORTANT

- *If you set the video recorder to a channel which is occupied by a local station or has neighbouring channels that are occupied by local stations, the picture reception quality will be affected and some interference noise will appear on the TV screen. Be sure to select a vacant channel which has no broadcast on neighbouring channels.*
- *If you cannot obtain the two vertical white bars clearly with any channel between 22 and 69, consult your JVC dealer.*

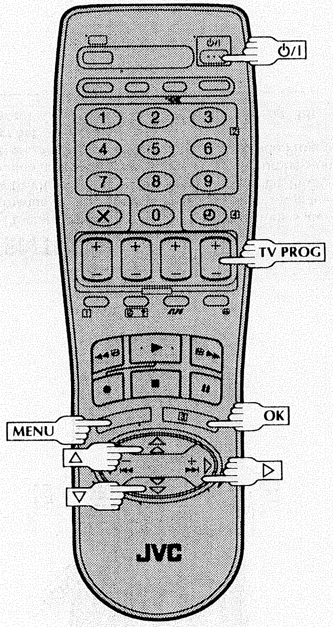
3 EXIT VIDEO CHANNEL SET MODE

Press **OK**.

To view picture signals from the video recorder, set your TV to the Video Channel.

Tuner Set

Turn on the TV and select the VIDEO channel (or AV mode).



IMPORTANT

Perform the following steps only if —
— Auto Channel Set has not been set correctly by Auto Set Up function (☞ pg. 6).
— you have moved to a different area or if a new station starts broadcasting in your area.

Your recorder needs to memorise all necessary stations in preset positions in order to record TV programmes. Auto Channel Set automatically assigns all receivable stations in your area to call them up by using the **TV PROG** buttons without going through any vacant channel.

Auto Channel Set

1 TURN ON THE RECORDER

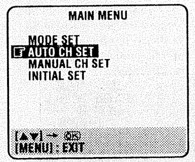
Press ⏻/I.

2 ACCESS MAIN MENU SCREEN

Press **MENU**.

3 PERFORM AUTO CHANNEL SET

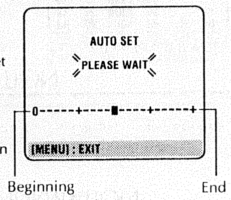
Move the highlight bar (pointer) to "AUTO CH SET" by pressing △▽, then press **OK** or ▷.


MAIN MENU

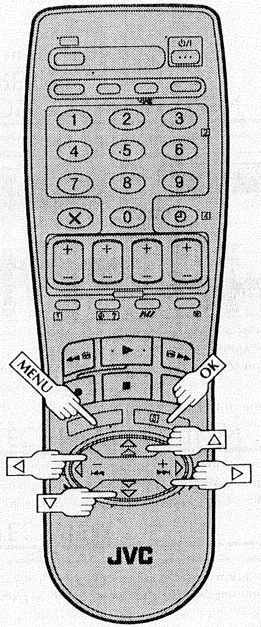
MODE SET
AUTO CH SET
MANUAL CH SET
INITIAL SET

[▲▼] → OK
[MENU] : EXIT

- The Auto Set screen appears, and remains on screen while the recorder searches for receivable stations. As Auto Channel Set progresses, the " ■ " mark on the screen moves from left to right. Wait until the screen as shown in step **4** appears.

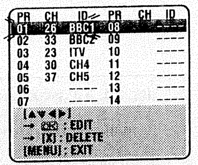

AUTO SET
PLEASE WAIT
0-----+----■----+-----+
[MENU] : EXIT

- Auto Channel Set usually takes about 4 – 12 minutes; the duration varies by area.



4 VIEW CONFIRMATION SCREEN

After "SCAN COMPLETED" is displayed on the screen for about 5 seconds, a Confirmation screen looking like the one on the right appears. The stations your recorder located appear on a Confirmation screen — preset positions (PR), channels (CH) and station names (ID – ☞ pg. 35). The blueback screen and the programme currently being broadcast by the station which is blinking appear alternately for 8 seconds each. To view the next page, use the △▽ ◁ ▷ button on the remote control.


PR	CH	ID	PR	CH	ID
01	26	BBC1	08		----
02	33	BBC2	09		----
03	23	ITV	10		----
04	30	CH4	11		----
05	37	CH5	12		----
06		----	13		----
07		----	14		----

[▲▼◀▶]
→ OK : EDIT
→ [X] : DELETE
[MENU] : EXIT

- The Guide Program numbers will also be set automatically during Auto Channel Set.

5 RETURN TO NORMAL SCREEN

Press **MENU**.

- Using the Confirmation screen, you can skip or add preset positions, enter station names and perform other operations. Refer to pages 32 – 36 for the procedures.
- Depending on reception conditions, the stations may, on occasion, not be stored in order, and the station names may not be stored correctly.

IMPORTANT

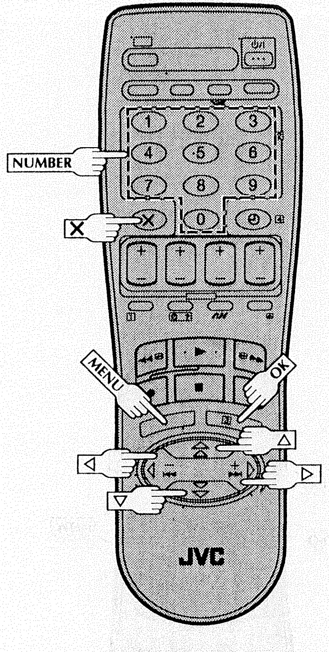
- In certain reception conditions, station names may not be stored correctly, and auto Guide Program Number Set may not work properly. If the Guide Program numbers are not set properly, when you timer-record a TV programme using VIDEO Plus+, the recorder will record a TV programme of a different station. When programming the timer using VIDEO Plus+, be sure to check that the preset position corresponding to the broadcasting station you wish to record has been selected (☞ pg. 12, "VIDEO Plus+ Timer Programming").
- Your video recorder memorizes all detected stations even if reception of some of them is poor. In these cases picture quality may be poor. To delete those stations which have an unacceptable picture ☞ "Delete A Channel" on page 33.

NOTES:

- *Fine tuning is performed automatically during Auto Channel Set. If you wish to perform it manually, refer to page 33.*
- *If, for any reason, you perform Auto Channel Set when the aerial cable is not connected properly, "SCAN COMPLETED -NO SIGNAL-" appears on the screen in step **4**. When this happens, make sure of the aerial connection and press **OK**; Auto Channel Set will take place again.*

Storing Channels Manually

To store channels that were not stored during Auto Set Up (☞ pg. 6) or Auto Channel Set (☞ pg. 30).



ATTENTION
Guide Program numbers are not set when channels are stored manually. If an attempt is made at timer programming with VIDEO Plus+ in this state, the "GUIDE PROG SET" screen appears; set the Guide Program numbers on this screen. ☞ "ATTENTION – Regarding Guide Program Number Set" on pg. 13.
Or perform "Guide Program Number Set" (☞ pg. 38).

1 ACCESS MAIN MENU SCREEN

Press **MENU**.

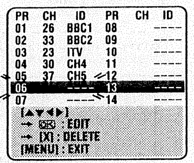
2 ACCESS CONFIRMATION SCREEN

Press △▽ to move the highlight bar (pointer) to "MANUAL CH SET", then press **OK** or ▷. The Confirmation screen appears.

3 SELECT POSITION

Press △▽ ◁ ▷ until an open position in which you want to store a channel begins blinking, then press **OK**. The Manual Channel Set screen appears.

(Ex.) To store in position 6.

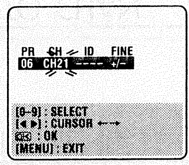


```
PR  CH  ID    PR  CH  ID
01  26  BBC1  08      ----
02  33  BBC2  09      ----
03  23  ITV   10      ----
04  30  CH4   11      ----
05  37  CH5   12      ----
06      ----  13      ----
07      ----  14      ----
[▲▼◀▶]
→ OK : EDIT
→ [X] : DELETE
[MENU] : EXIT
```

The blueback screen and the programme currently being broadcast by the selected channel appear alternately for 8 seconds each.

4 INPUT CHANNEL

Press the **NUMBER** keys to input the channel number you want to store.



```
PR  CH    ID    FINE
06  CH21  ----  +/-
[0–9] : SELECT
[◀ ▶] : CURSOR ←→
OK : OK
[MENU] : EXIT
```

The blueback screen and the programme currently being broadcast by the selected channel appear alternately for 8 seconds each.

For HR-J265ES Owners:
First press △▽ to select the band, either CH(regular) or CC(cable), and press ▷, then input the channel number.

- To input the registered station name (ID – ☞ pg. 35), press ▷ until "– – – –" (ID setting) begins blinking, then press △▽.
- For fine tuning adjustment, press ▷ until "+/–" begins blinking, then press △▽. While tuning, "+" or "–" appears.

5 ENTER NEW CHANNEL INFORMATION

Press **OK** and the Confirmation screen appears.

- Repeat steps **3** through **5** as necessary.

6 CLOSE CONFIRMATION SCREEN

Press **MENU**.

- To change positions, see "Change Station Preset Position" (☞ pg. 33).
- If you wish to set station names other than the ones registered in your recorder, ☞ "Set Stations (B)" on page 34.

Delete A Channel

Perform steps **1** and **2** of "Storing Channels Manually" on page 32 to access the Confirmation screen before continuing.

1 SELECT ITEM

Press △▽ ◁ ▷ until the item you want to delete begins blinking.

2 DELETE CHANNEL

Press X.

- The item directly beneath the cancelled one moves up one line.
- Repeat steps **1** and **2** as necessary.

3 CLOSE CONFIRMATION SCREEN

Press **MENU**.

Change Station Preset Position

Perform steps **1** and **2** of "Storing Channels Manually" on page 32 to access the Confirmation screen before continuing.

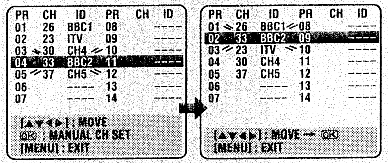
1 SELECT ITEM

Press △▽ ◁ ▷ until the item you want to move begins blinking. Then press **OK** and the station name (ID) and its channel (CH) number begin blinking.

2 SELECT NEW POSITION

Press △▽ ◁ ▷ to move the station to the new preset position, then press **OK**.

Example: If you moved the station in position 4 to position 2, the stations originally in positions 2 and 3 each move down one space.



```
PR  CH  ID    PR  CH  ID
01  26  BBC1  08      ----
02  23  ITV   09      ----
03  30  CH4   10      ----
04  33  BBC2  11      ----
05  37  CH5   12      ----
06      ----  13      ----
07      ----  14      ----
[▲▼◀▶] : MOVE
OK : MANUAL CH SET
[MENU] : EXIT
```

```
PR  CH  ID    PR  CH  ID
01  26  BBC1  08      ----
02  33  BBC2  09      ----
03  23  ITV   10      ----
04  30  CH4   11      ----
05  37  CH5   12      ----
06      ----  13      ----
07      ----  14      ----
[▲▼◀▶] : MOVE → OK
[MENU] : EXIT
```

- Repeat steps **1** and **2** as necessary.

3 CLOSE CONFIRMATION SCREEN

Press **MENU**.

Fine-Tuning Channels Already Stored

Perform steps **1** and **2** of "Storing Channels Manually" on page 32 to access the Confirmation screen before continuing.

1 SELECT CHANNEL TO FINE-TUNE

Press △▽ ◁ ▷ until the channel you want to tune begins blinking.

2 ACCESS MANUAL CHANNEL SET SCREEN

Press **OK** twice. The Manual Channel Set screen appears.

3 PERFORM TUNING

Press ▷ until "+/–" begins blinking, then press △▽ until the picture is clearest. Then press **OK**.

- The Confirmation screen appears.
- Repeat steps **1** through **3** as necessary.

4 CLOSE CONFIRMATION SCREEN

Press **MENU**.

ATTENTION
If channel positions are changed or deleted, the Guide Program numbers that have been set are reset.

- Example 1: If a channel is deleted, all the Guide Program numbers are reset.
- Example 2: If a channel is changed from position 4 to position 2, the Guide Program numbers above position 4 are reset.
- Example 3: If a channel is changed from position 4 to position 6, the Guide Program numbers above position 6 are reset.
- In Examples 2 and 3, if the channel is moved to position 10 before **OK** is pressed, the Guide Program numbers above position 10 are reset.
  If an attempt is made at timer programming with VIDEO Plus+ in this state, the "GUIDE PROG SET" screen appears; set the Guide Program numbers on this screen. ☞ "ATTENTION – Regarding Guide Program Number Set" on pg. 13.
  Or perform "Guide Program Number Set" (☞ pg. 38).

Set Stations (A)

Set station names that are registered in your recorder.

Perform steps **1** and **2** of "Storing Channels Manually" on page 32 to access the Confirmation screen before continuing.

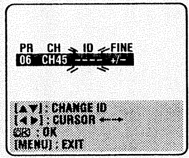
1 SELECT ITEM

Press △▽ ◁ ▷ until the item you want to set begins blinking.

2 ACCESS MANUAL CHANNEL SET SCREEN

Press **OK** twice.

3 SELECT NEW STATION



Press ▷ until the station name (ID) begins blinking, then press △▽ until the new station's name (ID) you want to store begins blinking.
Registered station names (☞ pg. 35) appear as you press △▽.

4 SWITCH STATIONS

Press **OK**.

- The Confirmation screen appears.
- Repeat steps **1** through **4** as necessary.

5 CLOSE CONFIRMATION SCREEN

Press **MENU**.

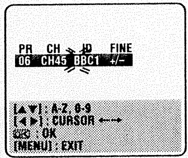
Set Stations (B)

Set station names other than the ones registered in your recorder.

Perform steps **1** and **2** of "Storing Channels Manually" on page 32 to access the Confirmation screen and then perform step **1** and **2** of "Set Stations (A)" on the left before continuing.

1 SELECT STATION NAME CHARACTER

Press ▷ until the first letter of the station name begins blinking.



2 ENTER NEW CHARACTER

Press △▽ to cycle through the characters (A–Z, 0–9, –, ∗, +, ␣ (space)) and stop when the desired character is indicated, then press ▷ to enter. Enter the remaining characters the same way (maximum of 4).
After entering all characters, press **OK**.

- The Confirmation screen appears.
- If you make a mistake, press ◁ until the incorrect character begins blinking. Then enter the correct character by pressing △▽.

3 CLOSE CONFIRMATION SCREEN

Press **MENU**.

TV Station And ID List

STATION NAME	ID*
Anglia TV	ANGL
ARD	ARD
ARTE	ARTE
BBC Group	BBC
BBC1	BBC1
BBC2	BBC2
Berlin 1	BLN1
Berlin 2	BLN2
Border TV	BORD
Bayern1	BR1
Bayern3	BR3
BRT1	BRT1
BRT2	BRT2
Children Ch	CHLD
Canal +	CH+
CNN	CNN
Channel TV	CHNL
Central TV	CNTR
Channel 4	CH 4
Channel 5	CH 5
DRS	DRS
DR TV	DRTV
DSF	DSF
Euronews	EURN
Euronews	EURO
Eurosports	EURS
France1	FR1
France2	FR2
France3	FR3
Granada TV	GRNA
Grampian TV	GRMP
Hessen1	HR1
Hessen3	HR3
HRT	HRT
HTV	HTV
ITV Network	ITV
Kabelkanal	KABL
London	LNDN
MDR	MDR
MTV	MTV
Nord3	N3
NDR1	NDR1
NDR3	NDR3
NED1	NED1
NED2	NED2
NED3	NED3
Network 2	NET2
NRK	NRK
N-TV	N-TV
Offener Kanal	OKAN
ORF1	ORF1
ORF2	ORF2
ORF3	ORF3
OWL 3	OWL3
Premiere	PRMI
PRO7	PRO7
RAI1	RAI1
RAI2	RAI2
RAI3	RAI3
RB1	RB1
RB3	RB3
Rikisutvarpid-S	RKPS
RTBF 1	RTB1
RTBF 2	RTB2
RTE 1	RTE1
RTL	RTL
RTL 2	RTL2
RTP	RTP

STATION NAME	ID*
SAT	SAT
SAT 1	SAT1
Scottish TV	SCOT
SC4	SC4
SDR	SDR
SDR1	SDR1
SFB1	SFB1
SFB3	SFB3
SKY	SKY
Sky One	SKY1
Sky Net	SKYN
Sport	SPRT
SR 1	SR1
Super RTL	SRTL
STV Test	STVT
STV 1	STV1
STV 2	STV2
Suedwest3	SWR
SWF 1	SWF1
Schweiz4	SWZ4
TYNE TEES	TEES
Text	TEXT
TF1	TF1
TNT int	TNT
TRT int	TRT
TSI	TSI
TSR	TSR
TSW	TSW
TVE	TVE
TV Polonia	TVPA
TVP 1	TVP1
TVP 2	TVP2
TVS	TVS
TV2	TV2
TV5	TV5
Tele Zurich	TZUR
Ulster TV	ULST
Veronica	VERN
VIVA	VIVA
VIVA2	VIV2
VOX	VOX
VTM	VTM
VT4	VT4
West1	WDR1
West3	WDR3
YLE 1	YLE1
YLE 2	YLE2
Yorkshire TV	YORK
ZDF	ZDF
Zurich 1	ZUR1
3SAT	3SAT

* The "ID" abbreviation is what is shown on-screen in lieu of the station name. The "ID" abbreviation is listed in the Confirmation screen and is displayed on the TV screen each time the recorder is tuned to a different station.

TV Station Channel Number Guide

For customers in the U.K.

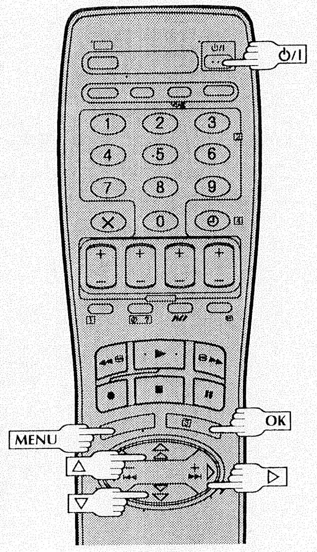
Only the main stations are listed. There are in addition many relay stations, and full lists are available from the BBC *and ITV.*

	BBC1	BBC2	ITV	CH4	CH5
London & South-East					
Bluebell Hill	40	46	43	65	—
Crystal Palace	26	33	23	30	37
Dover	50	56	66	53	—
Heathfield	49	52	64	67	—
Oxford	57	63	60	53	49
South-West					
Beacon Hill	57	63	60	53	—
Caradon Hill	22	28	25	32	—
Huntshaw Cross	55	62	59	65	67
Redruth	51	44	41	47	37
Stockland Hill	33	26	23	29	—
Channel Islands					
Fremont Point	51	44	41	47	—
South					
Hannington	39	45	42	66	35
Midhurst	61	55	58	68	—
Rowridge	31	24	27	21	—
West					
Mendip	58	64	61	54	37
East					
Sandy Heath	31	27	24	21	39
Sudbury	51	44	41	47	35
Tacolneston	62	55	59	65	52
Midlands					
Ridge Hill	22	28	25	32	35
Sutton Coldfield	46	40	43	50	37
The Wrekin	26	33	23	29	35
Waltham	58	64	61	54	35
North					
Belmont	22	28	25	32	56
Emley Moor	44	51	47	41	37

	BBC1	BBC2	ITV	CH4	CH5
North-West					
Caldbeck	30	34	28	32	56
Winter Hill	55	62	59	65	48
North-East					
Bilsdale West Moor	33	26	29	23	35
Chatton	39	45	49	42	—
Pontop Pike	58	64	61	54	68
Scotland					
Angus	57	63	60	53	—
Black Hill	40	46	43	50	37
Sandale	22	—	—	—	—
Caldbeck	—	34	28	32	56
Creigkelly	31	27	24	21	48
Darvel	33	26	23	29	35
Durris	22	28	25	32	67
Eitshal	33	26	23	29	—
Keelylang Hill	40	46	43	50	—
Knock More	33	26	23	29	—
Rosemarkie	39	45	49	42	67
Rumster Forest	31	27	24	21	—
Selkirk	55	62	59	65	52
Wales					
Blaenplwyf	31	27	24	21	56
Carmel	57	63	60	53	—
Llanddona	57	63	60	53	—
Moel-y-Parc	52	45	49	42	—
Presely	46	40	43	50	37
Wenvoe	44	51	41	47	—
Northern Ireland					
Brougher Mountain	22	28	25	32	—
Divis	31	27	24	21	37
Limavady	55	62	59	65	—

Clock Set

Turn on the TV and select the VIDEO channel (or AV mode).



Just Clock
The Just Clock function provides accurate time keeping through automatic adjustments at regular intervals, by reading data from a PDC signal.
The Just Clock option can be set "ON" or "OFF" at the Clock Set screen (the default setting is "ON"). Press **OK** until the Just Clock setting begins blinking, then press △▽ to change the setting.

IMPORTANT: If you turn the Just Clock function off, the accuracy of your recorder's built-in clock may be impaired, which could adversely affect timer recording.

NOTES:

- *Just Clock (when set to "ON") adjusts the recorder's built-in clock every hour, except for 23:00, 0:00, 1:00 and 2:00.*
- *Just Clock is not effective when . . .*
  - *the recorder's power is on.*
  - *the recorder is in the Timer mode.*
  - *a difference of more than 3 minutes exists between the built-in clock's time and the actual time.*
  - *the recorder is in the Auto Satellite Prog Rec mode (☞ pg. 20).*
- *If Just Clock is set to "ON", the recorder's clock is automatically adjusted at the start/end of Summer Time.*
- *Just Clock may not function properly in poor reception conditions.*

IMPORTANT
If you performed Auto Set Up (☞ pg. 6) or Auto Channel Set (☞ pg. 30), without ever having set the clock previously, the recorder's built-in clock is also set automatically.
Perform the following steps only if —
— Auto Clock Set has not been performed correctly by Auto Set Up or Auto Channel Set.
or
— the recorder's memory backup has expired.
or
— you want to change Just Clock setting (☞ "Just Clock" in the left column).

1

TURN THE RECORDER ON

Press ⏻/I.

2

ACCESS MAIN MENU SCREEN

Press **MENU**.

3

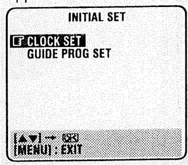
ACCESS INITIAL SET SCREEN

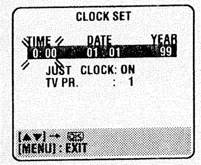
Move the highlight bar (pointer) to "INITIAL SET" by pressing △▽, then press **OK** or ▷.

4

ACCESS CLOCK SET SCREEN

Move the highlight bar (pointer) to "CLOCK SET" by pressing △▽, then press **OK** or ▷. The Clock Set screen appears.





5

SET DATE AND TIME

Press △▽ to set the time, then press **OK** or ▷. The "DATE" display begins blinking. Repeat the same procedure to set the date and year.

- When you set the time, press and hold △▽ to change the time by 30 minutes.
- When you set the date, press and hold △▽ to change the date by 15 days.

6

SET JUST CLOCK

The default setting is "ON". Set as desired by pressing △▽, then press **OK** or ▷.

- For the Just clock function, ☞ "Just Clock" on the left.
- If you set to "OFF", you can disregard the next step as you won't be able to receive regular clock adjustments.

7

SET CLOCK DATA SOURCE PRESET

The recorder is preset to receive clock setting and adjustment data from preset position 1. Press △▽ to set the preset position to the number representing the station transmitting clock setting data (BBC1, BBC2, etc.), then press **OK** or ▷.

8

START CLOCK OPERATION

Press **MENU**.

VIDEO Plus+ Setup

IMPORTANT

Normally, Auto Set Up (☞ pg. 6) or Auto Channel Set (☞ pg. 30) sets the Guide Program Numbers automatically. You need to set the Guide Program Numbers manually only in the following cases.

- *When timer-programming with VIDEO Plus+, the preset position, where the station you wish to record is received on your recorder, is not selected or when you add a channel after Auto Set Up or Auto Channel Set has taken place.*

— Set the Guide Program Number for that station manually.

- *When you delete a channel or change preset positions manually after Auto Set Up or Auto Channel Set has taken place.*

— Set the Guide Program Numbers for all the receivable stations manually.

- *When you wish to timer-record a satellite programme with VIDEO Plus+.*

— Set the Guide Program Numbers for all satellite broadcasts received on your satellite receiver.

Turn on the TV and select the VIDEO channel (or AV mode).

Guide Program Number Set

1 ACCESS MAIN MENU SCREEN

Press **MENU**.

2 ACCESS INITIAL SET SCREEN

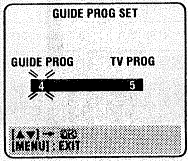
Press △▽ to move the highlight bar (pointer) to "INITIAL SET", then press **OK** or ▷.

3 ACCESS GUIDE PROG SET SCREEN

Press △▽ to move the highlight bar (pointer) to "GUIDE PROG SET", then press **OK** or ▷.

4 ENTER GUIDE PROG NUMBER

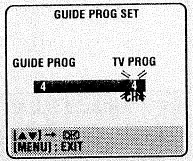
Press △▽ or **NUMBER** keys to enter the Guide Program number for the desired station as shown in the TV listings. Then press **OK** or ▷.



(Ex.) When inputting the Guide Program number 4 for CH4.

5 ENTER RECEIVING PRESET POSITION NUMBER

Press △▽ or **NUMBER** keys to input the number of the recorder's preset position on which the Guide Program number's broadcast is received. Then press **OK** or ▷.



(Ex.) If CH4 is received on preset position 4.

- If the satellite broadcast is received on your recorder's auxiliary channel "L-2", select "L-2" for the preset position.
- Repeat steps **4** and **5** as necessary.

6 RETURN TO NORMAL SCREEN

Press **MENU**.

Guide Program Number

"Guide Program (GUIDE PROG) number" refers to the assigned TV station numbers, according to broadcast area, for VIDEO Plus+ timer recording. The Guide Program numbers can be found in most TV listings.

Questions And Answers

PLAYBACK

Q. What happens if the end of the tape is reached during playback or search?

A. The tape is automatically rewound to the beginning.

Q. Can the video recorder indefinitely remain in the still mode?

A. No. It stops automatically after 5 minutes to protect the heads.

Q. During search, slow, still and frame-by-frame playback, I can't hear any audio. What's the problem?

A. This is normal.

Q. When returning from variable-speed search to normal playback, the picture is disturbed. Should I be concerned about this?

A. No, it is normal.

Q. Noise bars appear during variabl-speed search. What's the problem?

A. This is normal.

Q. Other than preventing further recording, what effect does removing the Record Safety tab have?

A. It disables marking of index codes.

Q. Sometimes, during Index Search, the video recorder can't find the programme I want to see. Why not?

A. There may be index codes too close together.

RECORDING

Q. When I pause and then resume a recording, the end of the recording before the pause is overlapped by the beginning of the continuation of recording. Why does this happen?

A. This is normal. It reduces distortion at the pause and resume points.

Q. Can the video recorder indefinitely remain in the Record-Pause mode?

A. No. The video recorder shuts off automatically after 5 minutes to protect the heads.

Q. What happens if the tape runs out during recording?

A. The video recorder automatically rewinds it to the beginning or, if Timer Recording, the cassette is ejected.

TIMER RECORDING

Q. "◌" and "◷" remain lit on the display panel. Is there a problem?

A. No. This is a normal condition for a timer recording in progress.

Q. Can I programme the timer while I'm watching a tape or a TV broadcast?

A. You won't see the picture as it is replaced by the on-screen menu, but the audio from the program or tape you're viewing can be heard.

Q. Is it possible to timer-record a TV programme broadcast in 2000?

A. Yes, it is possible.

ATTENTION

This recorder contains microcomputers. External electronic noise or interference could cause malfunctioning. In such cases, switch the recorder off and unplug the mains power cord. Then plug it in again and turn the recorder on. Take out the cassette. After checking the cassette, operate the unit as usual.

Troubleshooting

Before requesting service for a problem, use this chart to see if you can correct the trouble yourself. Small problems are often easily corrected, and this can save you the trouble of sending your video recorder off for repair.

POWER

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. No power is applied to the recorder.	• The mains power cord is disconnected.	Connect the mains power cord.
2. The clock is functioning properly, but the recorder cannot be powered.	• "🕘" is displayed on the display panel with Auto Timer set to "OFF".	Press the 🕘 button to turn the "🕘" indicator off.
3. The remote control won't function.	• The batteries are discharged.	Replace the dead batteries with new ones.

TAPE TRANSPORT

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. The tape does not run during recording.	• "⣿" is displayed on the display panel.	Press **PLAY** to turn the "⣿" indicator off.
2. The tape will not rewind or fast-forward.	• The tape is already fully rewound or fast-forwarded.	Check the cassette.

PLAYBACK

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. The playback picture does not appear while the tape is running.	• If you're using the RF OUT connection . . . . . . the TV receiver's channel selector is not set to the VIDEO channel. . . . the recorder's VIDEO channel has not been correctly set. • If you're using the AV connection, the TV receiver is not set to the AV mode.	If you are using the RF OUT connection . . . . . . set the TV receiver to the VIDEO channel. (☞ pg. 6) . . . Perform "Video Channel Set" (☞ pg. 28) If you are using the AV connection, set the TV to its AV mode.
2. Noise appears during visual search.	• This is normal.	
3. Noise appears during normal playback.	• The automatic tracking mode is engaged.	Try manual tracking (☞ pg. 24).
4. The playback picture is blurred or interrupted while TV broadcasts are clear.	• The video heads may be dirty.	Consult your JVC dealer.
5. Breaks are noticeable in Hi-Fi soundtrack.	• Automatic tracking is engaged.	Engage and adjust tracking manually. (☞ pg. 24)

RECORDING

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. Recording cannot be started.	• There is no cassette loaded, or the cassette loaded has had its Record Safety tab removed.	Insert a cassette, or using adhesive tape, reseal the slot where the tab was removed.
2. TV broadcasts cannot be recorded.	• "L-1" or "L-2" has been selected as the input mode.	Set to the desired preset.
3. Tape-to-tape editing is not possible.	• The source (another video recorder, camcorder) has not been properly connected. • All necessary power switches have not been turned on. • The input mode is not correct.	Confirm that the source is properly connected. Confirm that all units' power switches are turned on. Set the input mode to "L-1" or "L-2".
4. Camcorder recording is not possible.	• The camcorder has not been properly connected. • The input mode is not correct.	Confirm that the camcorder is properly connected. Set the input mode to "L-1" or "L-2".

TIMER RECORDING

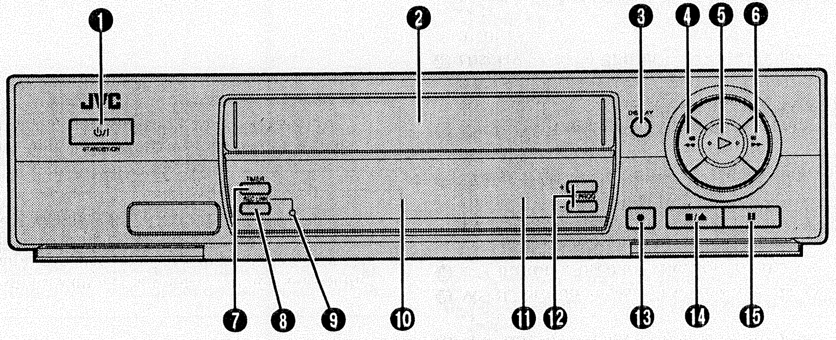
SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. Timer recording won't work.	• The clock and/or the timer have been set incorrectly. • The timer is not engaged.	Re-perform the clock and/or timer settings. Press 🕘 and confirm that "🕘" is displayed on the display panel.
2. Timer programming is not possible.	• Timer recording is in progress.	Timer programming can't be performed while a timer recording is in progress. Wait until it finishes.
3. "🕘" and "[OO]" on the display panel won't stop blinking.	• The timer is engaged but there's no cassette loaded.	Load a cassette with the Record Safety tab intact, or cover the hole using adhesive tape.
4. The cassette is automatically ejected, and "🕘" and "[OO]" on the display panel won't stop blinking.	• The loaded cassette has had its Record Safety tab removed.	Remove the cassette and cover the hole with adhesive tape, or insert a cassette with the Record Safety tab intact.
5. "🕘" blinks for 10 seconds and the Timer mode is disengaged.	• 🕘 has been pressed when there are no programs in memory, or the timer record information has been programmed incorrectly.	Check the programmed data and re-programme as necessary, then press 🕘 again.
6. The cassette is automatically ejected, the power shuts off and "🕘" and "[OO]" won't stop blinking.	• The end of the tape was reached during timer recording.	The programme may not have been recorded in its entirety. Next time make sure you have enough time on the tape to record the entire programme.
7. VIDEO Plus+ does not timer-record properly.	• The recorder's preset positions have been set incorrectly.	Refer to "Guide Program Number Set" and re-perform the procedure (☞ pg. 38).

OTHER PROBLEMS

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. Whistling or howling is heard from the TV during camcorder recording.	• The camcorder's microphone is too close to the TV. • The TV's volume is too high.	Position the camcorder so its microphone is away from the TV. Turn the TV's volume down.
2. When scanning channels, some of them are skipped over.	• Those channels have been designated to be skipped.	If you need the skipped channels, restore them (☞ pg. 32).
3. The preset cannot be changed.	• Recording is in progress.	Press **PAUSE** to pause the recording, change presets, then press **PLAY** to resume recording.
4. Channel settings that were made manually seem to have changed or disappeared.	• After the manual settings were made, Auto Channel Set was performed.	Perform manual setting again.
5. No channels are stored in the recorder's memory.	• The TV aerial cable was not connected to the recorder when Auto Set Up was performed.	Connect the TV aerial cable to the recorder properly and turn off the recorder power once, then turn the recorder power back on again. The recorder will try Auto Set Up again (☞ pg. 6).

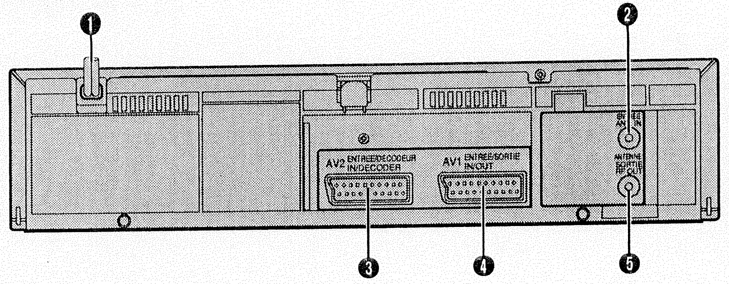
Index

FRONT VIEW



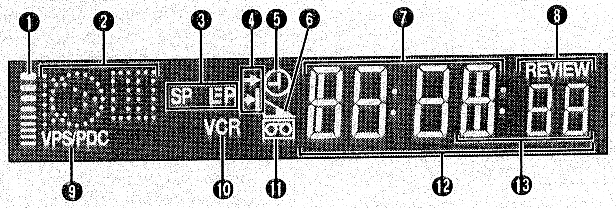
❶ **STANDBY/ON ⏻/I Button** turns recorder on/off (loading a cassette also turns power on).
❷ **Cassette Loading Slot** is where cassette is inserted; door closes, "cassette loaded" mark lights up on front display panel.
❸ **DISPLAY Button** switches display between clock time, tape remaining time, counter readings, preset position*. ☞ pg. 11
** Preset position is not displayed during playback.*
❹ **Rewind [REW] Button** rewinds the tape ☞ pg. 8; initiates high-speed reverse search. ☞ pg. 9
❺ **PLAY Button** plays back tape ☞ pg. 8; cancels Pause, Still, Slow, Search modes. ☞ pg. 9
❻ **Fast Forward [FF] Button** fast-forwards tape ☞ pg. 8; initiates high-speed forward search. ☞ pg. 9
❼ **TIMER Button** engages timer standby mode. ☞ pg. 13, 15
❽ **REC LINK Button** enables/disables the Auto Satellite Prog Rec mode. ☞ pg. 21
❾ **REC LINK Indicator** lights up during Auto Satellite Prog Rec mode. ☞ pg. 21
❿ **Display Panel** provides clear view of various displays and indicators. ☞ pg. 43
⓫ **Infrared Beam Receiving Window** is where remote control should be aimed when in use.
⓬ **TV PROG +/– Buttons** select a preset position. ☞ pg. 10
⓭ **RECORD Button** starts regular recording (press once), Instant Timer Recording (press twice); sets duration of ITR. ☞ pg. 10, 11
⓮ **STOP/EJECT Button** stops tape; ejects tape during Stop mode. ☞ pg. 8
⓯ **PAUSE Button** stops tape temporarily during recording ☞ pg. 10; stops tape temporarily during playback; plays back frame by frame with each additional press. ☞ pg. 9

REAR VIEW



❶ **Mains Power Cord** supplies power to recorder. ☞ pg. 5
❷ **ANT. IN Connector** enables connection of aerial. ☞ pg. 5
❸ **AV2 IN/DECODER Connector** enables connection of satellite receiver or second recorder; input recordable when "L-2" selected. ☞ pg. 20, 22
❹ **AV1 IN/OUT Connector** enables AV connection to TV or second recorder; input recordable when "L-1" selected. ☞ pg. 5, 22
❺ **RF. OUT Connector** enables connection to aerial terminal of TV receiver. ☞ pg. 5

DISPLAY PANEL

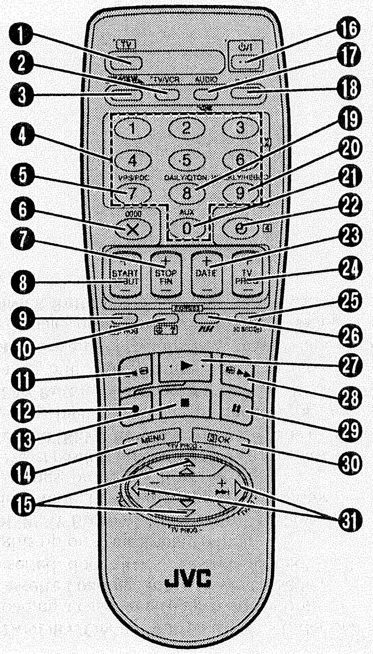


❶ **B.E.S.T. Picture System Display** lights from bottom to top while B.E.S.T. is active. ☞ pg. 18
❷ **Symbolic Mode Indicators**

PLAY: FF/REW VARIABLE SHUTTLE SEARCH:	▷	STILL: SLOW:	▷▦
		RECORD:	○
		RECORD PAUSE:	○▦

❸ **Tape Speed Indicators** display mode of recording; light during Record or Play mode. ☞ pg. 10
** EP is only for NTSC playback.*
❹ **Programme Time Indicators** show the programme start time (⇥) and the programme stop time (→|) for timer-recording. ☞ pg. 14
❺ **"Timer" Indicator** lights when ◷ has been pressed to engage Timer mode. ☞ pg. 13, 15
❻ **Tape Remaining Time Indicator** displays time remaining on tape when certain buttons are pressed. ☞ pg. 11
❼ **Channel Display** shows preset position where the station currently being received is stored.
Clock Display shows current time. ☞ pg. 7
❽ **Instant REVIEW Indicator** blinks after timer-recording and shows how many programmes have been timer-recorded. ☞ pg. 17
❾ **PDC Indicator** lights when PDC has been engaged for timer recording. ☞ pg. 13, 15
** VPS (Video Programme System) recording is not currently available in the U.K. and not possible with this recorder.*
❿ **VCR Indicator** lights when the video recorder is in the video mode. At this point, the TV automatically enters AV mode. ☞ pg. 8
⓫ **"Cassette Loaded" Mark** lights once a cassette is inserted; remains lit until cassette ejected.
⓬ **Counter** shows time elapsed since playback or recording began.
With ◣ displayed, shows time remaining from current tape position to end of tape (☞ pg. 11). Counter, Preset Position*, Clock and Tape Remaining Time Display appear alternately when **DISPLAY** (or – –:– –) is pressed.
** Preset Position is not displayed during playback.*
⓭ **Mode** shows external input mode selected (L-1, L-2).

REMOTE CONTROL



Buttons with a small dot on the left side of the name can also be used to operate your JVC TV while holding down the **TV** button. ☞ "Operating JVC TVs" on page 45.

This remote control transmits A code signals only; it is not applicable to B code signals.

① **TV Button** enables remote control of your JVC TV. ☞ "Operating JVC TVs" on page 45.

② **TV/VCR Button** switches connected TV's mode between TV and AV. ☞ pg. 8, 10 and "Operating JVC TVs" on page 45.

③ **REVIEW Button** "reviews" timer-recorded programme. ☞ pg. 17

④ **NUMBER Keys** are used in preset position selection ☞ pg. 10, VIDEO Plus+ timer programming ☞ pg. 12.

⑤ **PDC Button** enables/disables PDC recording. ☞ pg. 13, 15

** VPS (Video Programme System) recording is not currently available in the U.K. and not possible with this recorder.*

⑥ **× Button** cancels timer-programme. ☞ pg. 16
0000 Button resets counter to 0:00:00. ☞ pg. 11

⑦ **STOP +/– Button** inputs programme Stop Time. ☞ pg. 14

⑧ **START +/– Button** accesses Regular Program screen; inputs programme Start Time. ☞ pg. 14

⑨ **PROG Button** accesses VIDEO Plus+ Program screen. ☞ pg. 12

⑩ **◷ ? Button** accesses Program screens/displays to check the programme that you have programmed (next programme's information screen appears each time button is pressed). ☞ pg. 16

⑪ **Rewind [REW] Button** — same as button on recorder. ☞ pg. 8, 9

⑫ **Record Button** — same as button on recorder. ☞ pg. 10

⑬ **Stop Button** — same as button on recorder. ☞ pg. 8

⑭ **MENU Button** accesses Menu screen. ☞ pg. 18

⑮ **△▽ Button** is used for selection in on-screen menus. ☞ pg. 18
TV PROG +/– selects the connected JVC TV's channel. ☞ "Operating JVC TVs" on page 45.

⑯ **STANDBY/ON ⏻/I Button** — same as button on recorder.

⑰ **🔈/🔇 (TV Muting) Button** mutes sound of connected JVC TV. ☞ "Operating JVC TVs" on page 45.

⑱ **Display (– –:– –) Button** — same as button on recorder. ☞ pg. 11

⑲ **DAILY Button** enables timer recording of daily serials. ☞ pg. 13, 15

⑳ **WEEKLY Button** enables timer recording of weekly serials. ☞ pg. 13, 15

㉑ **AUX Button** selects recorder's auxiliary input mode. ☞ pg. 22

㉒ **◷ Button** engages timer-standby mode. ☞ pg. 13, 15

㉓ **DATE +/– Button** inputs date of programme for timer recording. ☞ pg. 14

㉔ **TV PROG +/– Button** — same as button on recorder. ☞ pg. 10

㉕ **30 SEC Button** initiates a 30-second period of fast-motion playback. ☞ pg. 17

㉖ **Auto Tracking Button** enables/disables auto tracking mode during playback ☞ pg. 24
SP/LP (///) Button selects tape speed. ☞ pg. 10

㉗ **Play Button** — same as button on recorder. ☞ pg. 8, 9

㉘ **Fast Forward Button** — same as button on recorder. ☞ pg. 8, 9

㉙ **Pause Button** — same as button on recorder. ☞ pg. 9

㉚ **OK Button** enters selections made in on-screen menus. ☞ pg. 18

㉛ **◁▷ Button** initiates functions such as Index Search ☞ pg. 17, variable-speed search, frame by frame playback. ☞ pg. 9
TV ⊿ +/–Button controls volume of connected JVC TV. ☞ "Operating JVC TVs" in the right column.

How To Use

The remote control can operate most of your video recorder's functions, as well as basic functions of JVC TV sets. (See below.)

- Point the remote control toward the sensor window.
- The maximum operating distance of the remote control is about 8 m.

Operating JVC TVs

To operate your TV, while holding down the **TV** button, press the corresponding button: **STANDBY/ON** ⏻/I, **TV/VCR**, **TV PROG** +/–, **TV** ⊿ +/–, 🔈/🔇 (TV Muting).

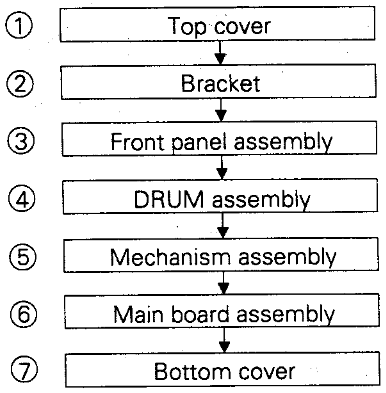
NOTES:

- *When inserting the batteries, be sure to insert in the correct directions as indicated under the battery cover.*
- *Depending on the type of JVC TV, there may be cases where some or all functions cannot be operated using the remote control.*
- *If the remote control doesn't work properly, remove its batteries, wait a short time, replace the batteries and then try again.*

SECTION 1
DISASSEMBLY

1.1 DISASSEMBLY FLOW CHART

This flowchart lists the disassembling steps for the cabinet parts and P.C. boards in order to gain access to item(s) to be serviced. When reassembling, perform the step(s) in reverse order. Bend, route and dress the flat cables as they were originally laid.



1.2 HOW TO READ THE DISASSEMBLY AND ASSEMBLY

STEP /LOC NO.	PART NAME	FIG. NO.	POINT	NOTE
①	TOP COVER	D1	4(S1), (S2)	
②	BRACKET	D2	2(S3)	
③	FRONT PANEL ASSEMBLY	D3	7(L1)	<NOTE 1> <NOTE 2>
④	DRUM ASSEMBLY	D4	2(S4), DRUM SHIELD, 3(S5),WR1,WR2, *CN1	<NOTE 3>
⑤	MECHANISM ASSEMBLY	D5	2(S6),2(S7),WR3, 2(L2), *CN1	<NOTE 3> <NOTE 4>
⑥	MAIN BOARD ASSEMBLY	D6	3(S8),(S9),(S10), 6(L3)	
⑦	BOTTOM COVER	D7	2(L4), 9(L5)	<NOTE 5>

(1) (2) (3) (4) (5)

(1) Order of steps in Procedure
When reassembling, perform the step(s) in the reverse order. These numbers are also used as the identification (location) NO. of parts Figures.
(2) Part name to be removed or installed.
(3) Fig.No. showing procedure or part location
(4) Indentification of part to be removed,unhooked,unlocked, released,unpluged,unclamped or unsoldered. P = Spring, W = Washer, S = Screw, L = Locking tab, * = Unhook,unlock, release,unplug or unsolder.
(5) Adjustment information for installation

1.3 DISASSEMBLY/ASSEMBLY METHOD

STEP /LOC NO.	PART NAME	FIG. NO.	POINT	NOTE
①	TOP COVER	D1	4(S1), (S2)	
②	BRACKET	D2	2(S3)	
③	FRONT PANEL ASSEMBLY	D3	7(L1)	<NOTE 1> <NOTE 2>
④	DRUM ASSEMBLY	D4	2(S4), DRUM SHIELD, 3(S5),WR1,WR2, *CN1	<NOTE 3>
⑤	MECHANISM ASSEMBLY	D5	2(S6),2(S7),WR3, 2(L2), *CN1	<NOTE 3> <NOTE 4>
⑥	MAIN BOARD ASSEMBLY	D6	3(S8),(S9),(S10), 6(L3)	
⑦	BOTTOM COVER	D7	2(L4), 9(L5)	<NOTE 5>

<NOTE1>
When reattaching the Front panel assembly, make sure that the door opener ⓐ of the Cassette holder assembly is lowered in position prior to the reinstallation.

<NOTE2>
When reattaching the Front panel assembly, pay careful attention to the switch lever not to make it touch the switch knob ⓑ of the Main board assembly from the side.
(If the switch knob of the Main board assembly is damaged, cassette loading is impossible.)

<NOTE3>
When inserting the flat wire into the connector, be careful not to mistake the positioning of its electrodes.

<NOTE4>

- When it is required to remove the screws (S6) retaining the Mechanism assembly, please refer to the "Procedures for Lowering the Cassette holder assembly". (See on pages 1-3.)
- When removing the Mechanism assembly only, unhook the two spacers connecting it with the Main board assembly with pliers from the back side of the Main board assembly first, and then remove the Mechanism assembly.
- When reattaching the Mechanism assembly to the Main board assembly, take care not to damage the sensors on the Main board. (D3001: LED, Q3002: Start sensor, Q3003: End sensor)

<NOTE5>
When remove the bottom cover, push down the two tabs L4 to slide the bottom cover.

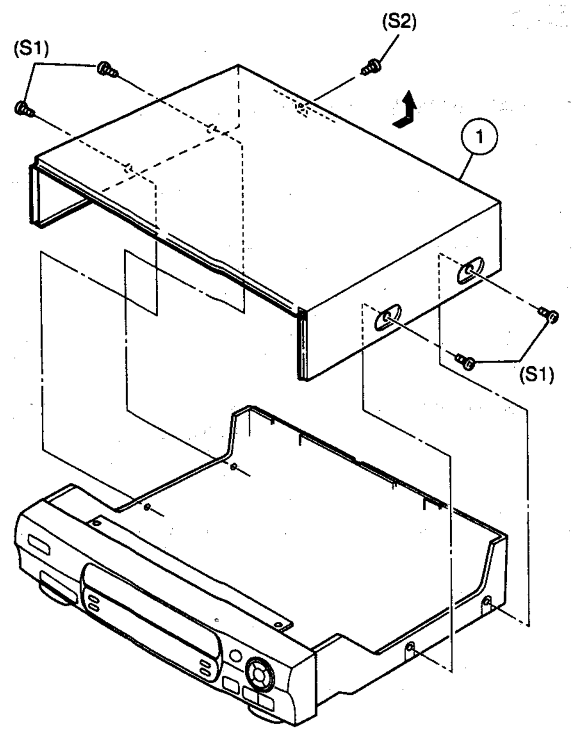


Fig. D1

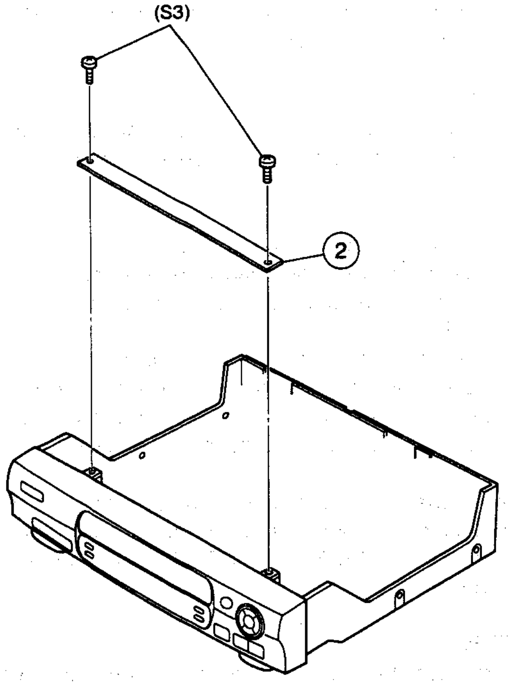


Fig. D2

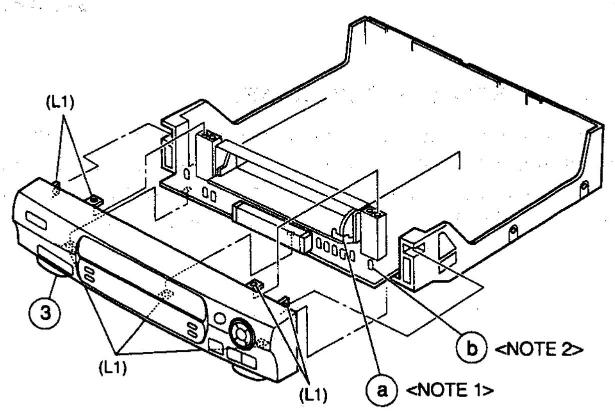


Fig. D3

NOTE : When installing the DRUM assembly, secure the screws (S5) in the order of A, B, C.

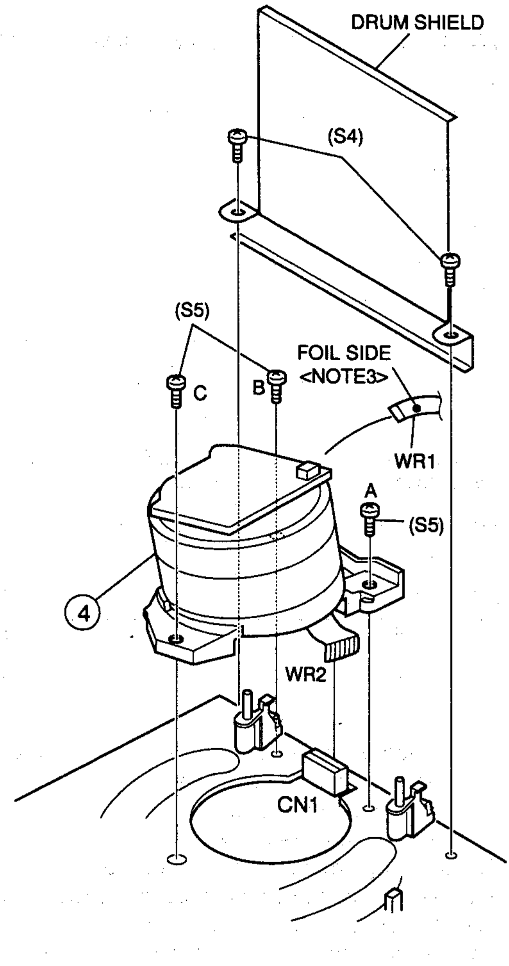

DRUM SHIELD
(S4)
(S5)
FOIL SIDE
<NOTE3>
C
B
WR1
A
(S5)
④
WR2
CN1

Fig. D4

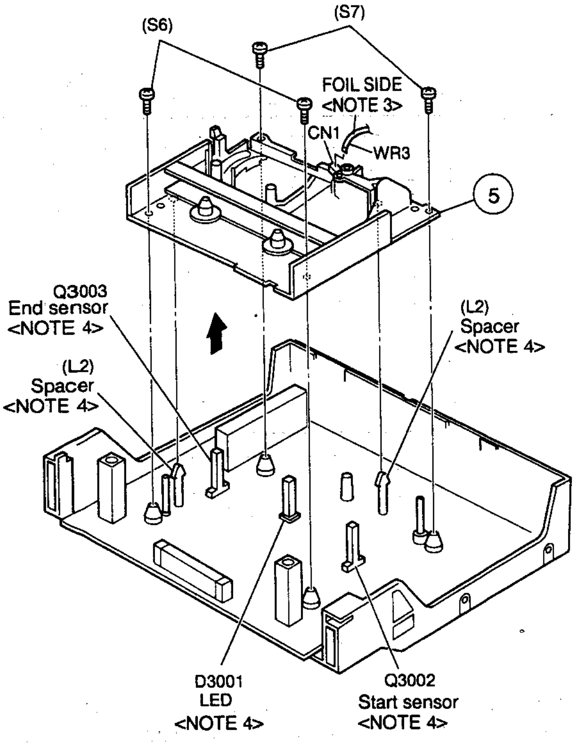

(S6)
(S7)
FOIL SIDE
<NOTE 3>
CN1
WR3
5
Q3003
End sensor
<NOTE 4>
(L2)
Spacer
<NOTE 4>
(L2)
Spacer
<NOTE 4>
D3001
LED
<NOTE 4>
Q3002
Start sensor
<NOTE 4>

Fig. D5

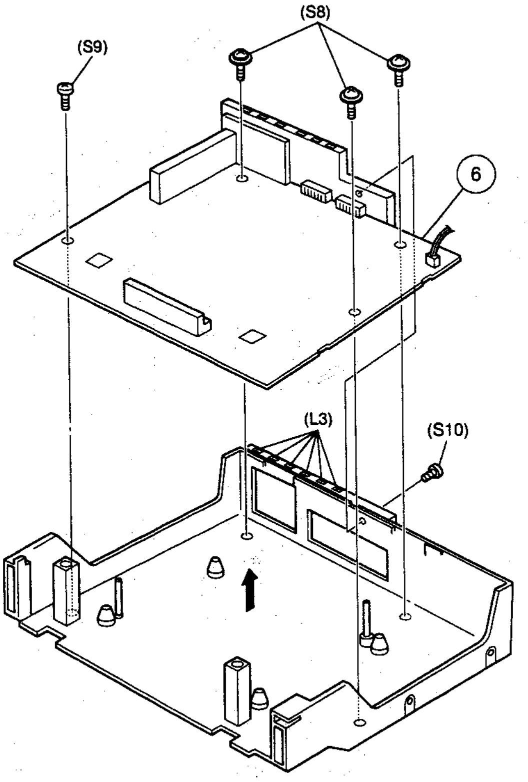

(S8)
(S9)
6
(L3)
(S10)

Fig. D6

Procedures for Lowering the Cassette holder assembly

As the mechanism of this unit is integrated with the Housing assembly, the holder must be lowered and the two screws unscrewed when removing the Mechanism assembly.

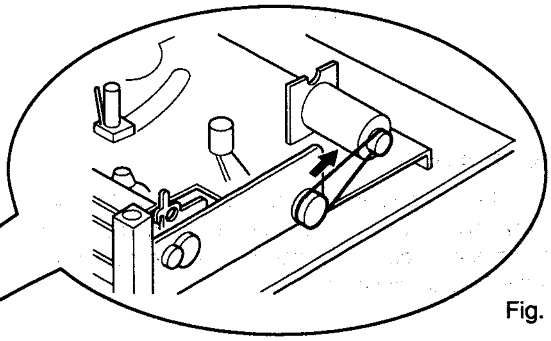


Fig. 2

Turn the loading motor pulley in the direction as indicated by Fig.2. As both Ⓐ and Ⓑ levers are lodged twice, push the levers in the direction as indicated by Fig.3 to release them. When pushing the levers, do it in the order of Ⓐ,Ⓑ,Ⓑ,Ⓐ. When the holder has been lowered, turn the pulley until the cassette holder is securely in place without allowing any up/down movement.

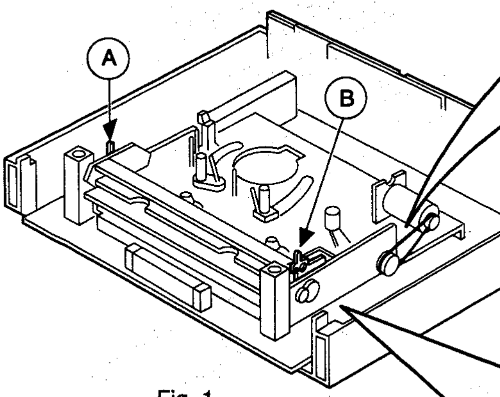


Fig. 1

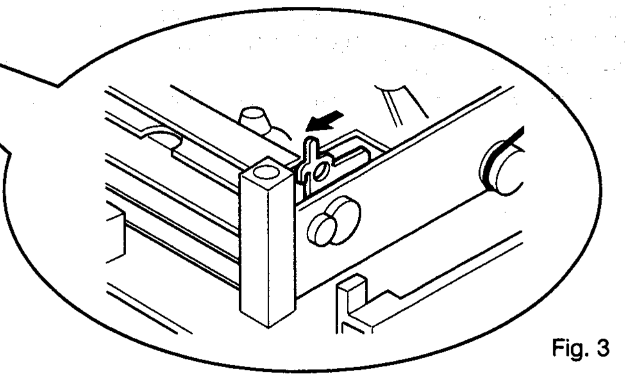


Fig. 3

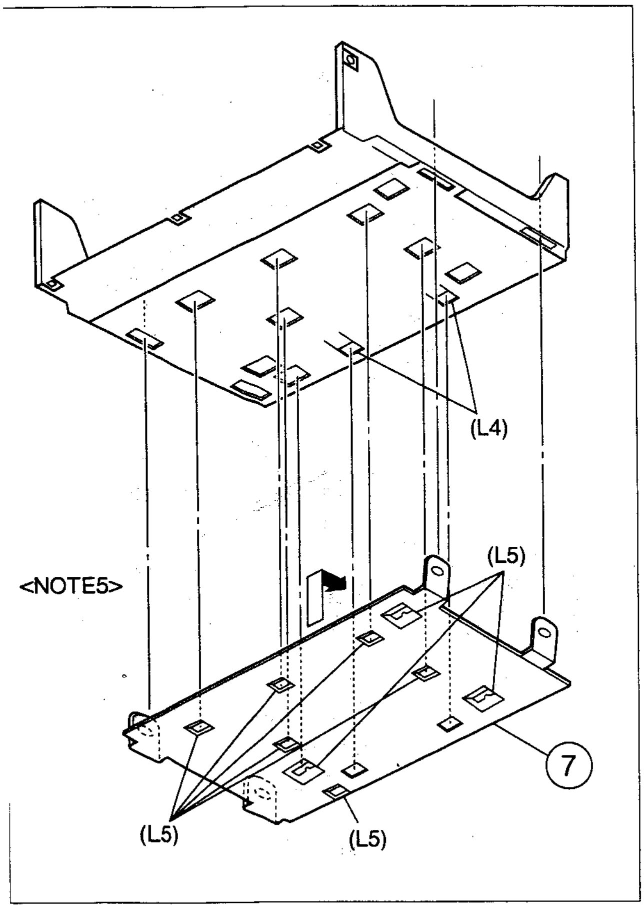


Fig. D7

1.4 SERVICE POSITION

In order to facilitate diagnosis and the repair of the Mechanism assembly, this unit is constructed so as to allow the Mechanism and Main board assemblies to be removed together from the Chassis assembly.

1.4.1 How to take out the Mechanism and Main board assemblies

(1) Remove the Top cover, Bracket and Front panel assembly. (See 1.3 DISASSEMBLY/ASSEMBLY METHOD. Take care not to pull the drum wire (Fig.D4) from CN1.)
(2) Lower the cassette holder, and make the preparations required in order to remove the screws from the Mechanism assembly. (Refer to the "Procedures for Lowering the Cassette holder assembly" on pages 1-3 of 1.3 DISASSEMBLY/ASSEMBLY METHOD.)
(3) Take out 2 screws Ⓐ and 2 screws Ⓑ as shown in Fig. 1-4-1.

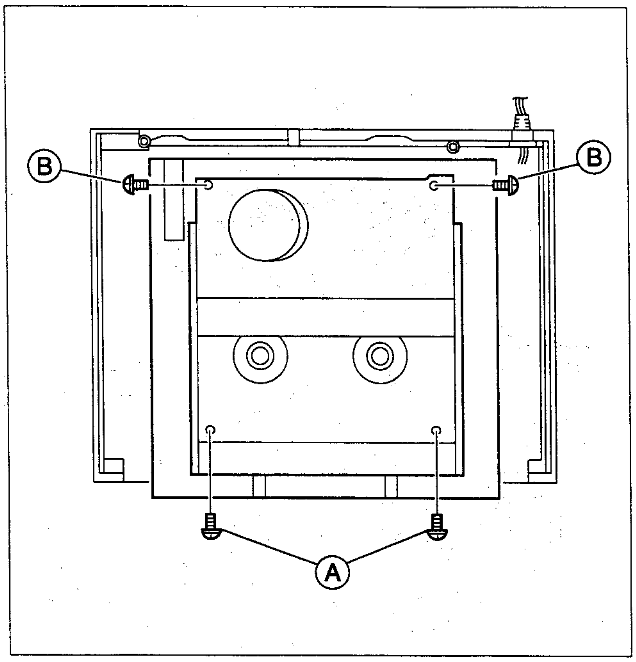


Fig. 1-4-1

(4) Take out 3 screws Ⓓ, 1 screw Ⓒ and 1 screw Ⓔ.
(5) Remove the Main board and Mechanism assemblies together while holding the edge of the Main board assembly. At this stage be careful of the power cord and prongs of the jacks on the back side. (See Fig. 1-4-2.)

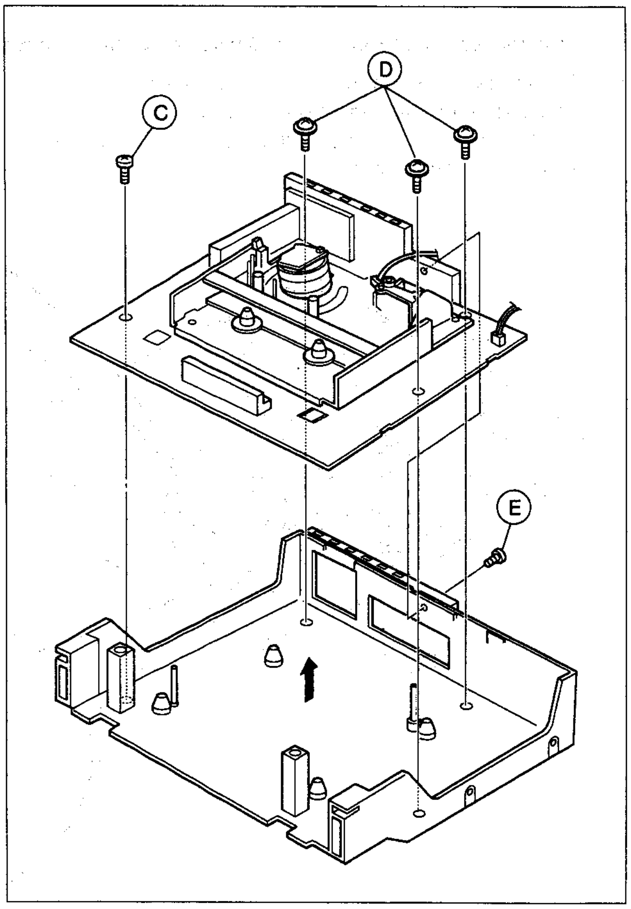


Fig. 1-4-2

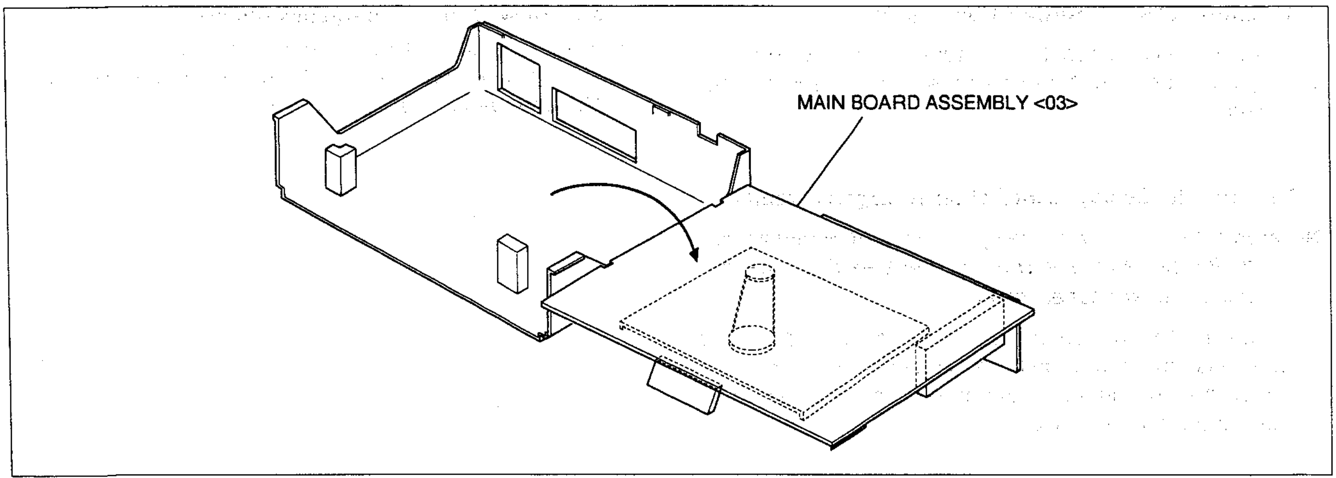


Fig. 1-4-3

(6) Connect the power cord to the wall socket, and lift the cassette holder.
(Before turning on the power make sure that there is nothing which may produce a short circuit, such as faulty soldering.)

(7) When performing a diagnosis or repair of the Main board assembly with a cassette tape in place, turn on the power, insert a cassette tape, and turn over the Main board and Mechanism assemblies together.

NOTES:
- *When carrying out diagnosis and repair of the Main board assembly in the service position, be sure to ground both the Main board and the Mechanism assemblies.*

  If they are improperly grounded, there may be noise on the playback picture or the FDP counter display may move even when the mechanism is kept in an inoperative status.
- *When performing diagnostics of the tape playback or recording condition in the "SERVICE POSITION", enter the desired mode before turning the set upside down, and do not change the mode during diagnostics while the set is placed upside down. If you want to switch the mode, turn the set to the normal position.*

1.5 MECHANISM SERVICE MODE

This model has a unique function to enter the mechanism into every operation mode without loading of any cassette tape. This function is called the "MECHANISM SERVICE MODE".

1.5.1 How to set the "MECHANISM SERVICE MODE"

(1) Disconnect VCR from AC.
(2) Connect TPGND and TP7001(TEST) on the Main board assembly with a jump wire.
(3) Connect VCR to AC.
(4) Press the POWER button.
(5) With lock levers ⒶⒷ on the left and right of the Cassette holder assembly pulled toward the front, slide the holder in the same direction as the cassette insertion direction. (For the positions of lock levers ⒶⒷ, refer to the "Procedures for Lowering the Cassette holder assembly" on pages 1-3 of 1.3 DISASSEMBLY/ASSEMBLY METHOD.)
(6) The cassette holder lowers and, when the loading has completed, the mechanism enters the desired mode.

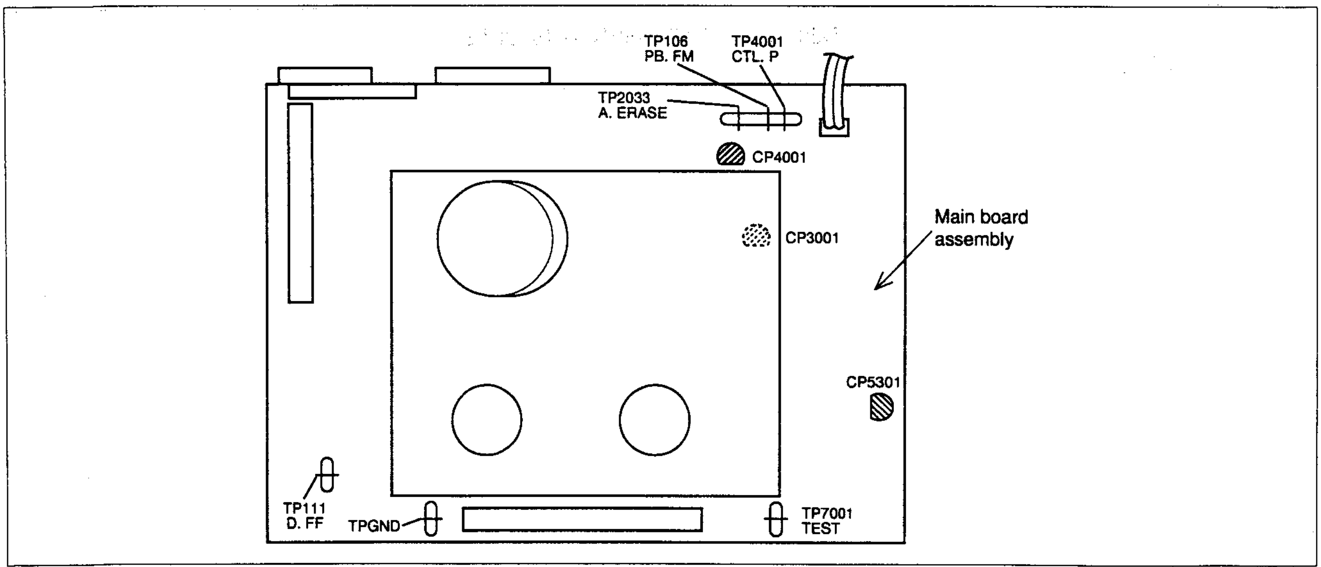


Fig. 1-5-1

1.6 EMERGENCY DISPLAY FUNCTION

This product has the function to store the last two previous emergency faults which can be displayed in the FDP when servicing.

1.6.1 How to display record of an emergency faults

Note: *Put the unit into A mode by using the VCR remote controller. (When it is in B mode, the preset remote control codes are not accepted.)*

(1) Press the "N" button of the presetting unit and the two previous emergency faults are shown in the FDP.
(2) Press the "N" button of the presetting unit again to return to the normal mode.

[Example] E : 01 : 03
03 ← Emergency fault before last
01 ← Emergency fault of the last time

[Example] E : — — : — — ← No record of emergency

1.6.3 How to clear emergency record

Press the COUNTER RESET button on the remote controller in the emergency record display mode, and the record of the emergency fault(s) is cleared.

1.6.2 Detail of emergency faults

EMG DATA	Symptom	Detect mode	Resulting mode
E : 01	Loading motor rotates for more than 8 Sec without shift to next mode.	Loading	POWER OFF
E : 02	Loading motor rotates for more than 8 Sec without shift to next mode.	Unloading	POWER OFF
E : 03	TU REEL FG input is absent. (for more than 4 Sec)	REC/PLAY/FF/REW SEARCH FF/SEARCH REW	STOP → POWER OFF
E : 04	DRUM FF input is absent. (for more than 3 Sec)	REC/PLAY/FF/REW SEARCH FF/SEARCH REW	STOP → POWER OFF
E : 06	CAPSTAN FG input is absent. (for more than 4 Sec)	REC/PLAY/FF/REW SEARCH FF/SEARCH REW	STOP → POWER OFF
E : 07	No SWD5V/12V	POWER ON	POWER OFF

Table 1-6-1 EMERGENCY FAULTS

1.7 SYSCON CIRCUIT

1.7.1 Syscon CPU pin function (IC3001) 1/2

PIN NO.	LABEL	IN/OUT	FUNCTION
1	CTL(+)	IN/OUT	CTL(+) SIGNAL
2	SVSS	-	GND
3	CTL(-)	IN/OUT	CTL(-) SIGNAL
4	CTLBIAS	-	CTL BIAS VOLTAGE
5	CTLFB	-	NC
6	CTLAMPOUT	OUT	CTL PULSE OUTPUT
7	CTLSMTIN	IN	CTL PULSE INPUT
8	CFG	IN	CAPSTAN FG PULSE INPUT
9	SVCC	-	SYSTEM POWER
10	AVCC	-	SYSTEM POWER FOR ANALOG CIRCUIT
11	MESECAM DET	-	NC
12	SECAM DET	-	NC
13	VIDEO ENV	IN	AUTO TRACKING DETECT/INPUT THE AVERAGE OF PLAYBACK VIDEO SIGNAL
14	START SENSOR	IN	START SENSOR
15	END SENSOR	IN	END SENSOR
16	IND(L)	-	NC
17	IND(R)	-	NC
18	SCR ID	-	NC
19	NC	-	NC
20	AFC	IN	TUNING CLOCK
21	RF AGC	IN	CHANGES IN ATS+IC OUTPUT AS CAUSED BY CHANGES IN RECEIVER SENSITIVITY WHEN THE SAME CHANNEL IS RECEIVED MORE THAN ONCE ARE INPUT.
22	A.ENV/ND(L)	-	NC
23	AVSS	-	GND FOR ANALOG CIRCUIT
24	CTL GAIN	OUT	CONTROL AMP OUT FREQUENCY RESPONSE SWITCHING
25	LSA	IN	MECHANISM MODE DETECT(A)
26	LSB	IN	MECHANISM MODE DETECT(B)
27	LSC	IN	MECHANISM MODE DETECT(C)
28	CAP REV(L)	OUT	CAPSTAN MOTOR REVERSE CONTROL (FWD:H/REV:L)
29	RC	IN	REMOTE CONTROL DATA INPUT
30	R.PAUSE	-	NC
31	PROJECT 50 IN	-	NC
32	LMC3	OUT	LOADING MOTOR DRIVE(3)
33	COMPULINK OUT	-	NC
34	PROJECT 50 OUT	-	NC
35	LMC1	OUT	LOADING MOTOR DRIVE(1)
36	LMC2	OUT	LOADING MOTOR DRIVE(2)
37	P.SAVE(L)	-	NC
38	P.CTL(H)	OUT	CONTROL SIGNAL FOR SWITCHING POWER SUPPLY
39	SIDE BAND GAIN	OUT	VOLTAGE CONTROL SIGNAL FOR VIDEO FREQUENCY RESPONSE
40	POWER DET	IN	DETECTION SIGNAL FOR POWER DOWN OF AC POWER SUPPLY
41	REC SAFETY	IN	REC SAFETY SWITCH DETECT (SW ON:L)
42	PROTECT	IN	DETECTION SIGNAL FOR SW POWER SUPPLY
43	VSS	-	GND
44	STB/TEST	OUT	STROBE SIGNAL (FOR FDP DRIVER)
45	VCC	-	SYSTEM POWER
46	JSA	-	NC
47	JSB	-	NC
48	STL(L)	-	NC
49	I2C DATA	IN/OUT	SERIAL DATA TRANSFER OUTPUT FOR THE ON-SCREEN IC
50	I2C CLK	OUT	SERIAL DATA TRANSFER CLOCK FOR THE ON-SCREEN IC
51	S.DATA TOSYS	IN	SERIAL DATA TRANSFER OUTPUT FROM THE ON-SCREEN IC TO THE FDP DRIVER
52	S.DATA FRSYS	OUT	SERIAL DATA TRANSFER OUTPUT FROM THE FDP DRIVER TO THE ON-SCREEN IC
53	S.CLK	OUT	SERIAL DATA TRANSMISSION CLOCK FROM THE FDP DRIVER TO THE ON-SCREEN IC
54	SP FG	IN	DETECTION SIGNAL FOR SUPPLY REEL ROTATION/TAPE REMAIN
55	TU FG	IN	DETECTION SIGNAL FOR TAKE-UP REEL ROTATION/TAPE REMAIN
56	LOCK(L)	IN	TUNING PLL LOCK DETECT:L
57	TU CE	OUT	CHIP ENABLE OF THE TUNER UNIT
58	SW2	OUT	“TUNER SYSTEM” “L” “MODE:L”
59	NC	-	NC
60	TU CLK	OUT	CLOCK FOR DATA TRANSFER TO THE TUNER UNIT

Table 1-7-1 SYSCON CPU pin function(1/2)

1.7.2 Syscon CPU pin function (IC3001) 2/2

PIN NO.	LABEL	IN/OUT	FUNCTION
61	TU DATA	OUT	TUNING DATA
62	FWE	-	NC
63	NMI(L)	-	NC
64	X2	-	TIMER CLOCK (32.768KHz)
65	X1	-	TIMER CLOCK (32.768KHz)
66	RES(L)	-	RESET TERMINAL (RESETON:L)
67	OSC1(IN)	-	MAIN SYSTEM CLOCK(10MHz)
68	VSS	-	GND
69	OSC2(OUT)	-	MAIN SYSTEM CLOCK(10MHz)
70	VCC	-	SYSTEM POWER
71	MODE	-	NC
72	TU A MUTE(H)	OUT	TUNER AUDIO MUTE CONTROL (MUTE:H)
73	TU V MUTE(H)	OUT	TUNER VIDEO MUTE CONTROL (MUTE:H)
74	SW1	OUT	"TUNER ""L"" SYSTEM MODE:H"
75	I2C CLK2	OUT	SERIAL DATA TRANSFER CLOCK FOR MEMORY IC
76	I2C DATA2	IN/OUT	SERIAL DATA TRANSFER OUTPUT FOR MEMORY IC
77	NC	-	NC
78	NC	-	NC
79	NC	-	NC
80	A.MUTE(H)	OUT	AUDIO MUTE CONTROL (MUTE:H)
81	FMA_ADJ	-	NC
82	VCC	-	SYSTEM POWER
83	CCIR(H)	-	NC
84	VSS	-	GND
85	SP SHORT(H)	-	NC
86	LP SHORT(H)	-	NC
87	N.REC ST(H)	OUT	NORMAL AUDIO SOUND RECORDING START
88	H.REC ST(H)	-	NC
89	B/W(H)	-	NC
90	NC	-	NC
91	OSD CS	OUT	CHIP SELECT FOR THE ON-SCREEN IC
92	SYNC DET(H)	IN	DETECTION OF VIDEO SYNC SIGNAL (DETECTED:H)
93	P.MUTE(L)	OUT	PICTURE MUTE CONTROL (MUTE:L)
94	SECAM(H)	-	NC
95	IP ON(H)	-	NC
96	NC	-	NC
97	N.REC(H)	OUT	NORMAL AUDIO REC MODE CONTROL (REC:H)
98	C.SYNC	IN	COMPOSITE SYNC
99	A.FF	-	NC
100	V.FF	OUT	ROTATION DETECTION SIGNAL FOR DRUM MOTOR/TIMING CONTROL SIGNAL FOR REC
101	CAPPWM	OUT	CAPSTAN MOTOR CONTROL
102	DRUMPWM	OUT	DRUM MOTOR CONTROL
103	NC	-	NC
104	S PB(H)/SP SEARCH(H)	-	NC
105	EE(L)	OUT	EE/PB CONTROL (EE MODE:L)
106	NC	-	NC
107	DPG	IN	DRUM PICKUP PULSE INPUT (SWITCHING PULSE)
108	DFG	IN	DRUM FG PULSE INPUT
109	VCC	-	SYSTEM POWER
110	V.PULSE	OUT	V.PULSE ADDITION TIMING CONTROL
111	VSS	-	GND
112	CTLREF	-	CTL REFERENCE VOLTAGE

Table 1-7-2 SYSCON CPU pin function(2/2)

SECTION 2
MECHANISM ADJUSTMENT

2.1 BEFORE STARTING REPAIR AND ADJUSTMENT

2.1.1 Precautions

(1) Unplug the power cable of the main unit before using your soldering iron.
(2) Take care not to cause any damage to the conductor wires when plugging and unplugging the connectors.
(3) Do not randomly handle the parts without identifying where the trouble is.
(4) Exercise enough care not to damage the lugs, etc. during the repair work.
(5) When installing the front panel assembly, be sure to hook the lug on the back side of the cassette door to the door opener of the cassette holder. If this operation is neglected it will not be possible to remove the cassette when ejecting because the housing door cannot be opened.

2.1.2 Checking for Proper Mechanical Operations

Enter the mechanism service mode when you want to operate the mechanism when no cassette is loaded. (See 1.5 MECHANISM SERVICE MODE.)

2.1.3 Manually Removing the Cassette Tape

1. In case of electrical failures

If you cannot remove the cassette tape which is loaded because of any electrical failure, manually remove it by taking the following steps.

(1) Unplug the power cable and remove the top cover, bracket and front panel assembly. (See 1.3 DISASSEMBLY/ASSEMBLY METHOD.)
(2) Unload the cassette by manually turning the loading motor of the mechanism assembly toward the front. In doing so, hold the tape by the hand to keep the slack away from any grease. (See Fig.2-1-1.)
(3) Bring the pole base assembly (supply or take-up side) to a pause when it reaches the position where it is hidden behind the cassette tape.
(4) Move the top guide toward the drum while holding down the lug Ⓐ of the bracket retaining the top guide. Likewise hold part Ⓑ down and remove the top guide. Section Ⓒ of the top guide is then brought under the cassette lid. Then remove the top guide by pressing the whole cassette tape down. (See Fig.2-1-2.)
(5) Remove the cassette tape by holding both the slackened tape and the cassette lid.
(6) Take up the slack of the tape into the cassette. This completes removal of the cassette tape.

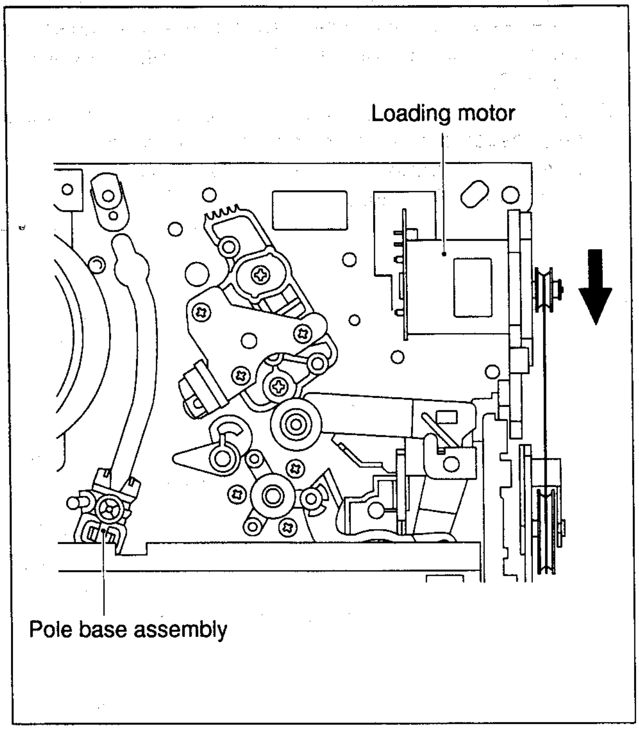


Fig. 2-1-1

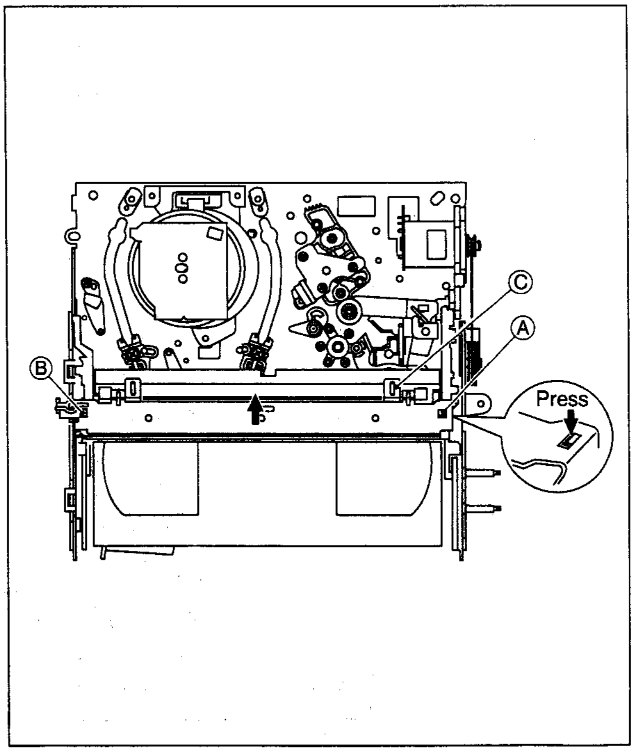


Fig. 2-1-2

2. In case of mechanical failure

f you cannot remove the cassette tape which is loaded because of any mechanical failure, manually remove it by taking the following steps.

(1) Unplug the power cable and remove the top cover, front panel assembly and others so that the mechanism assembly is visible. (See 1.3 DISASSEMBLY/ASSEMBLY METHOD.)

(2) While keeping the tension arm assembly of the mechanism assembly free from tension, pull the tape on the pole base assembly (supply or take-up side) out of the guide roller. (See Fig.2-1-3.)

(3) Take the spring of the pinch roller arm assembly off the hook of the press lever assembly, and detach it from the tape. (See Fig.2-1-4.)

(4) In the same way as in the electrical failure instructions in 2.1.3 (4), remove the top guide.

(5) Raise the cassette tape cover. By keeping it in that position, draw out the cassette tape case from the cassette holder and take out the tape.

(6) By hanging the pinch roller arm assembly spring back on the hook, take up the slack of the tape into the cassette.

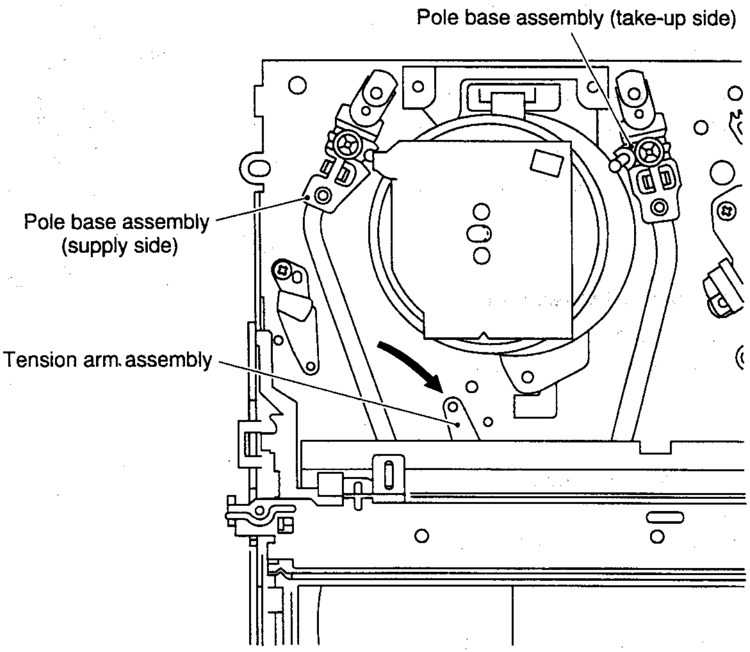

Pole base assembly (take-up side)
Pole base assembly (supply side)
Tension arm assembly

Fig. 2-1-3

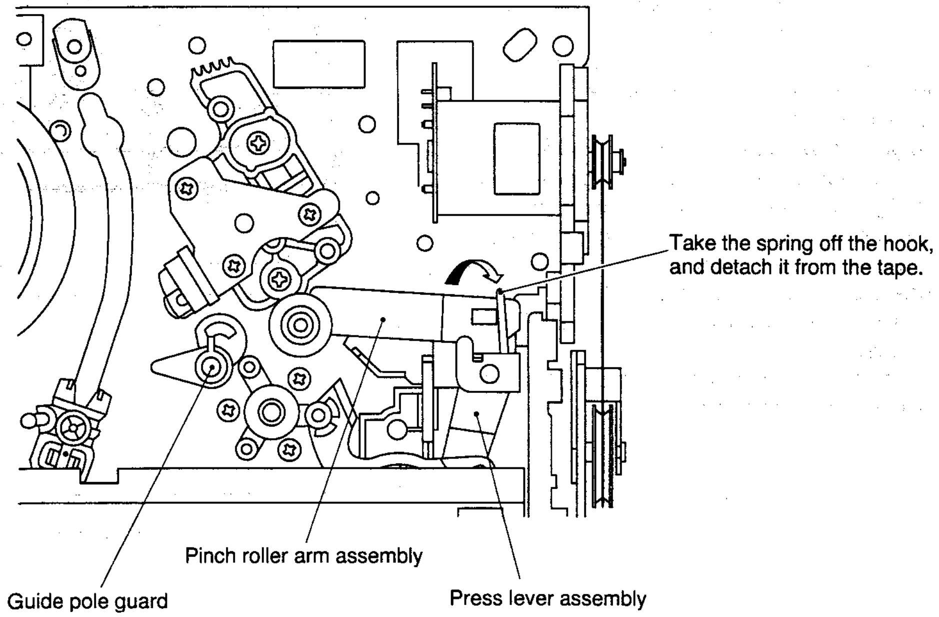

Take the spring off the hook, and detach it from the tape.
Pinch roller arm assembly
Guide pole guard
Press lever assembly

Fig. 2-1-4

2.1.4 Jigs and Tools Required for Adjustment

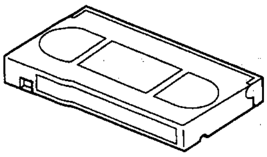
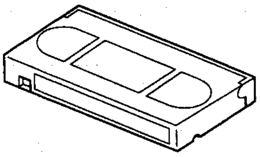
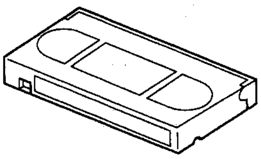
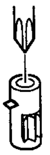
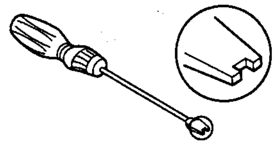
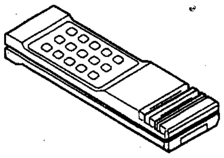
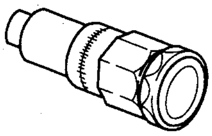
Alignment tape (SP) MHPE	Alignment tape (LP) MHPE-L	Back tension cassette gauge PUJ48076-2	A/C head position bit PTU94010
			
Roller driver PTU94002	Presetting unit PTU94008	Torque gauge PUJ48075-2	
			

Table 2-1-1 Jigs and tools required for adjustment

2.1.5 Maintenance and Inspection

1. Location of major mechanical parts

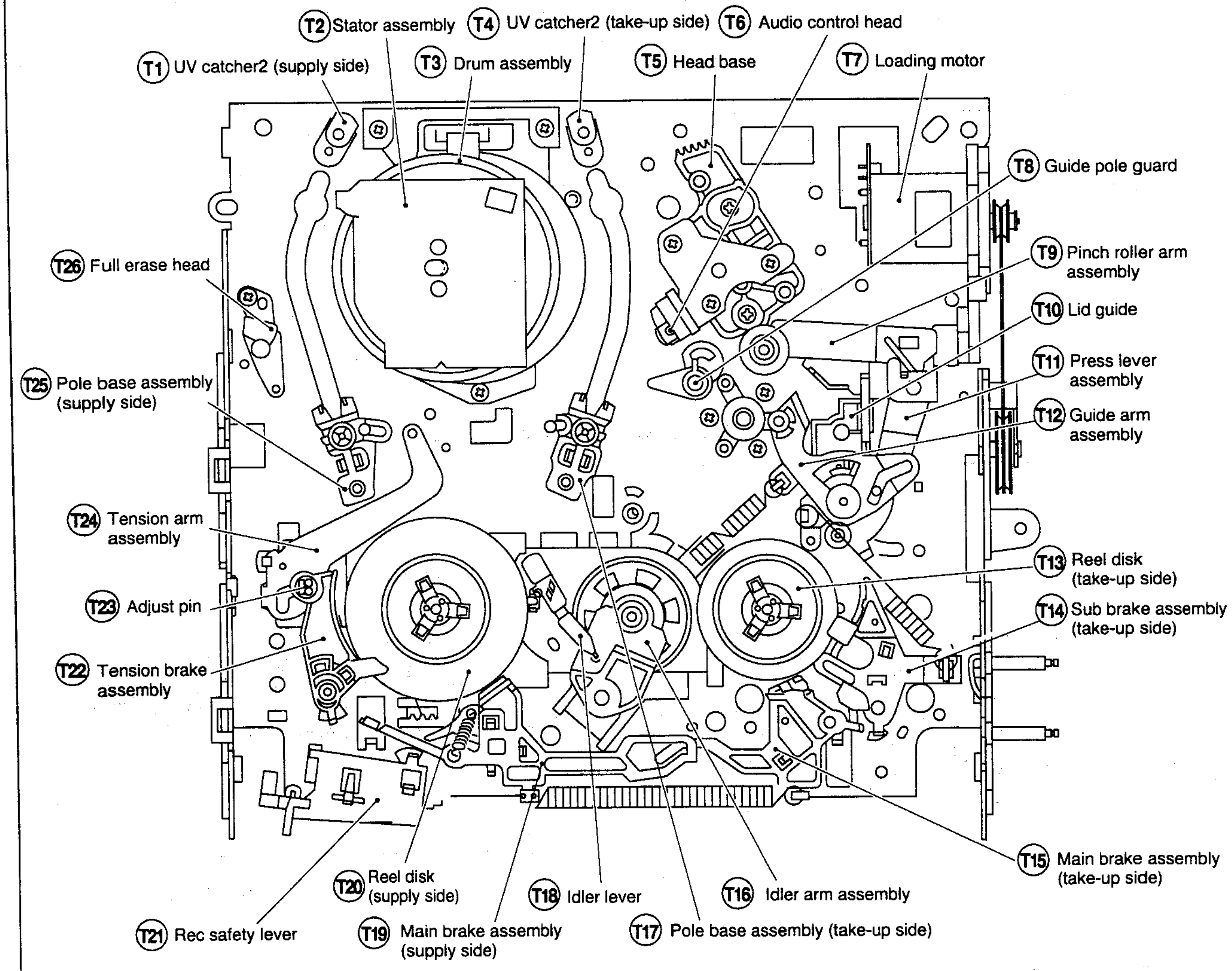

T1 UV catcher2 (supply side)
T2 Stator assembly
T3 Drum assembly
T4 UV catcher2 (take-up side)
T5 Head base
T6 Audio control head
T7 Loading motor
T8 Guide pole guard
T9 Pinch roller arm assembly
T10 Lid guide
T11 Press lever assembly
T12 Guide arm assembly
T13 Reel disk (take-up side)
T14 Sub brake assembly (take-up side)
T15 Main brake assembly (take-up side)
T16 Idler arm assembly
T17 Pole base assembly (take-up side)
T18 Idler lever
T19 Main brake assembly (supply side)
T20 Reel disk (supply side)
T21 Rec safety lever
T22 Tension brake assembly
T23 Adjust pin
T24 Tension arm assembly
T25 Pole base assembly (supply side)
T26 Full erase head

Fig. 2-1-5 Mechanism assembly top side

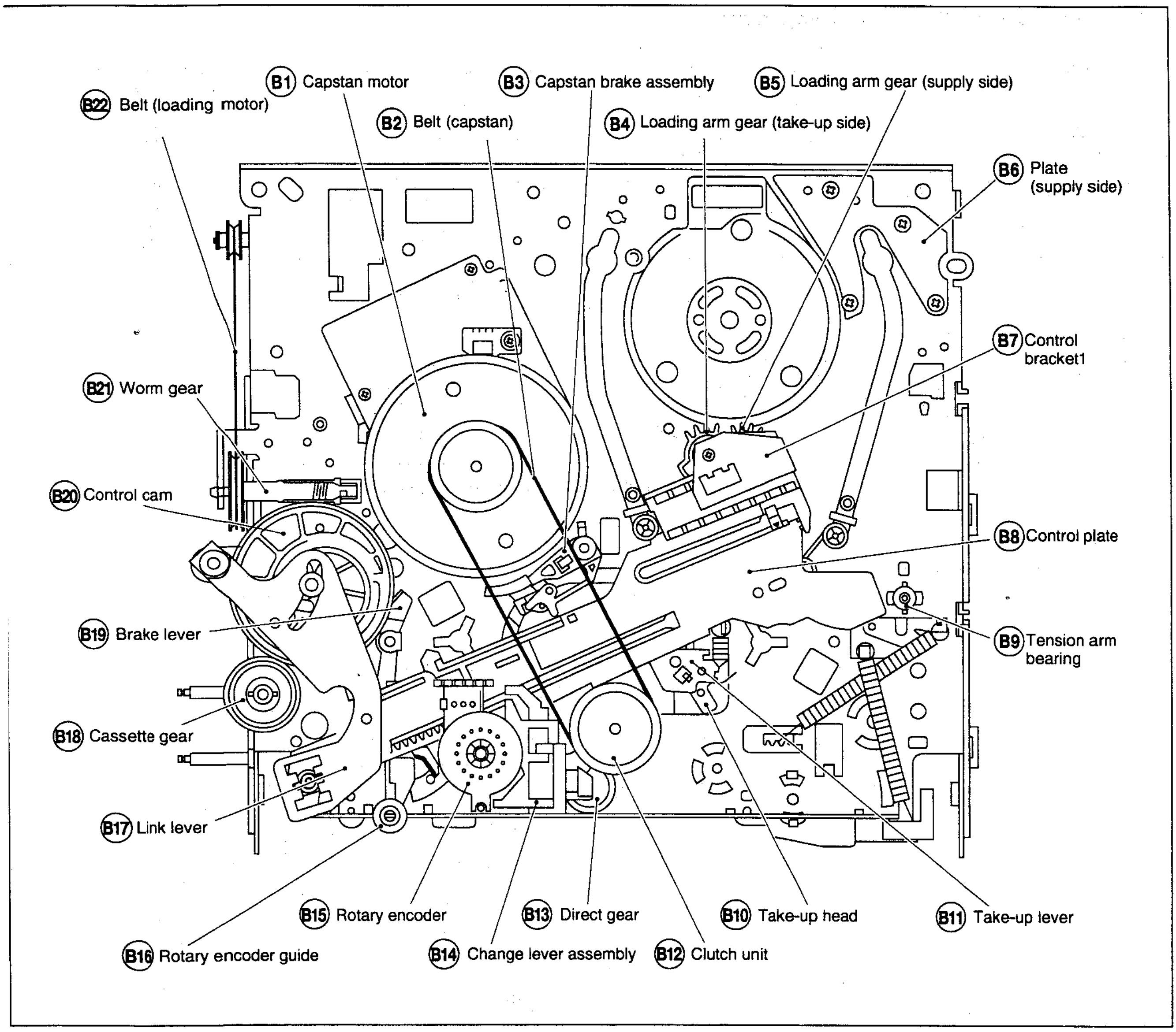

B1 Capstan motor
B3 Capstan brake assembly
B5 Loading arm gear (supply side)
B22 Belt (loading motor)
B2 Belt (capstan)
B4 Loading arm gear (take-up side)
B6 Plate (supply side)
B7 Control bracket1
B21 Worm gear
B20 Control cam
B8 Control plate
B19 Brake lever
B9 Tension arm bearing
B18 Cassette gear
B17 Link lever
B15 Rotary encoder
B13 Direct gear
B10 Take-up head
B11 Take-up lever
B16 Rotary encoder guide
B14 Change lever assembly
B12 Clutch unit

Fig. 2-1-6 Mechanism assembly bottom side

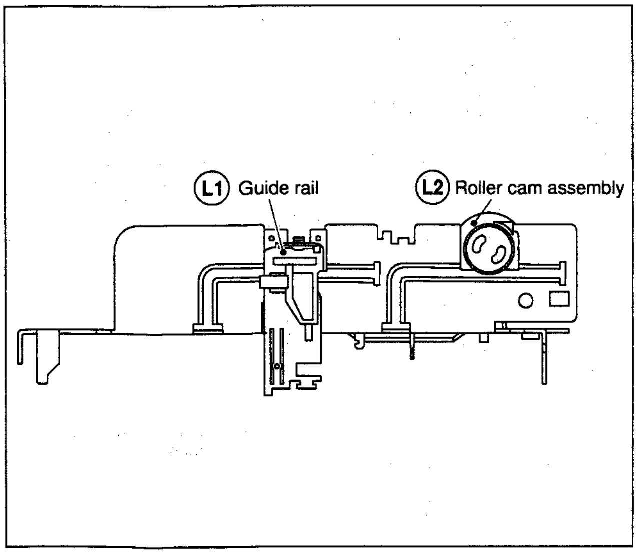

L1 Guide rail
L2 Roller cam assembly

Fig. 2-1-7 Mechanism assembly left side

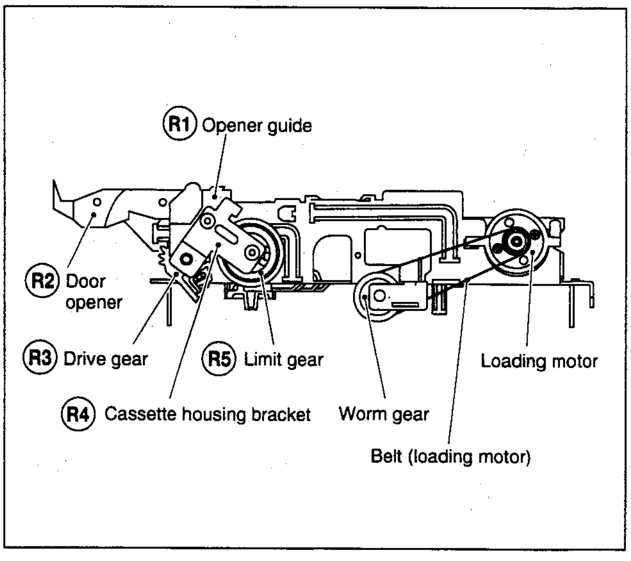

R1 Opener guide
R2 Door opener
R3 Drive gear
R5 Limit gear
Loading motor
R4 Cassette housing bracket
Worm gear
Belt (loading motor)

Fig. 2-1-8 Mechanism assembly right side

Note: *This table shows the order in which parts are removed for replacement. To replace parts, remove them in the order of 1 to 18 as shown in the table. To install them, reverse the removal sequence.*
The circled numbers (symbols and numbers) preceding the individual part names represent the numbers in the "Location of major mechanical parts" table. Also, the "T", "B", and "T/B" on the right of each part name shows that the particular part is removed from the front, from the back, and from both sides of the mechanism, respectively.

	Symbols and numbers			(L1)	(L2)	(R4)	(R1)	–	–	(R3)	–	(T9)	(T12)	(T11)	(T1)(T4)	(B15)	(B12)	(B14)	(B13)	(B17)	(B21)	(B7)	(B8)	(B5)	(B4)	(B11)	(T14)	(T15)	(T13)	(T22)	(T24)	(T18)	(B19)
Symbols and numbers	Removal parts / (Reference items) Replacement parts	Front (T)/Back (B) of mechanism	Number of removal steps	Guide rail	Roller cam assembly	Cassette housing bracket	Opener guide	Relay gear	Cassette holder assembly	Drive gear	Drive arm	Pinch roller arm assembly	Guide arm assembly	Press lever assembly	UV catcher2	Rotary encoder	Clutch unit	Change lever assembly	Direct gear	Link lever	Worm gear	Control bracket1	Control plate	Loading arm gear (supply side)	Loading arm gear (take-up side)	Take-up lever	Sub brake assembly (take-up side)	Main brake assembly (take-up side)	Reel disk (take-up side)	Tension brake assembly	Tension arm assembly	Idler lever	Brake lever
(L1)	2.2.3 Guide rail	T	1																														
(L2)	2.2.3 Roller cam assembly	T	1																														
(R4)	2.2.3 Cassette housing bracket	T	1																														
(R1)	2.2.3 Opener guide	T	2			1																											
(R2)	2.2.3 Door opener	T	3			1	2																										
–	2.2.3 Relay gear	T	3			1	2																										
(R5)	2.2.3 Limit gear	T	3			1	2																										
–	2.2.3 Cassette holder assembly	T	6	1	2	3	4	5																									
(R3)	2.2.3 Drive gear	T	4			1	2	3																									
–	2.2.3 Drive arm	T	8	1	2	3	4	5	6	7																							
(T9)	2.2.4 Pinch roller arm assembly	T	1																														
(T12)	2.2.5 Guide arm assembly	T	1																														
(T11)	2.2.5 Press lever assembly	T	3									1	2																				
(T6)	2.2.6 Audio control head	T	1																														
(T7)	2.2.7 Loading motor	T	1																														
(B1)	2.2.8 Capstan motor	T/B	1																														
(T1)(T4)	2.2.9 UV catcher2	T	1																														
(T17)	2.2.9 Pole base assembly (take-up side)	T/B	2												1																		
(T25)	2.2.9 Pole base assembly (supply side)	T/B	2												1																		
(B15)	2.2.10 Rotary encoder	B	1																														
(B12)	2.2.11 Clutch unit	B	1																														
(B14)	2.2.12 Change lever assembly	B	3													1	2																
(B13)	2.2.12 Direct gear	B	4													1	2	3															
–	2.2.12 Clutch gear1	B	5													1	2	3	4														
(B17)	2.2.13 Link lever	B	1																														
(B18)	2.2.14 Cassette gear	B	2																	1													
(B20)	2.2.14 Control cam	B	2																	1													
(B21)	2.2.14 Worm gear	B	1																														
(T10)	- Lid guide	T/B	5									1	2	3							4												
(B7)	2.2.15 Control bracket1	B	1																														
(B8)	2.2.15 Control plate	B	6													1	2	3		4		5											
(B5)	2.2.16 Loading arm gear (supply side)	B	7													1	2	3		4		5	6										
(B4)	2.2.16 Loading arm gear (take-up side)	B	8													1	2	3		4		5	6	7									
–	2.2.16 Loading arm gear shaft	B	9													1	2	3		4		5	6	7	8								
(B11)	2.2.17 Take-up lever	T/B	7													1	2	3		4		5	6										
(B10)	2.2.17 Take-up head	T/B	8													1	2	3		4		5	6			7							
–	2.2.17 Control plate guide	T/B	8													1	2	3		4		5	6			7							
(B3)	2.2.18 Capstan brake assembly	T/B	7													1	2	3		4		5	6										
(T14)	2.2.19 Sub brake assembly(take-up side)	T/B	15	1	2	3	4	5	6	7	8					9	10	11		12		13	14										
(T15)	2.2.20 Main brake assembly(take-up side)	T/B	16	1	2	3	4	5	6	7	8					9	10	11		12		13	14				15						
(T19)	2.2.20 Main brake assembly(supply side)	T/B	9	1	2	3	4	5	6	7	8																						
(T13)	2.2.20 Reel disk (take-up side)	T/B	16	1	2	3	4	5	6	7	8					9	10	11		12		13	14				15						
(T22)	2.2.21 Tension brake assembly	T/B	9	1	2	3	4	5	6	7	8																						
(T20)	2.2.21 Reel disk (supply side)	T/B	10	1	2	3	4	5	6	7	8																			9			
(T24)	2.2.21 Tension arm assembly	T/B	10	1	2	3	4	5	6	7	8																			9			
(B9)	2.2.21 Tension arm bearing	T/B	10	1	2	3	4	5	6	7	8																			9			
(T18)	2.2.22 Idler lever	T/B	17	1	2	3	4	5	6	7	8					9	10	11		12		13	14							15	16		
(T16)	2.2.22 Idler arm assembly	T/B	18	1	2	3	4	5	6	7	8					9	10	11		12		13	14							15	16	17	
(B19)	- Brake lever	T/B	18	1	2	3	4	5	6	7	8					9	10	11		12		13	14				15	16	17				
(B16)	- Rotary encoder guide	T/B	19	1	2	3	4	5	6	7	8					9	10	11		12		13	14				15	16	17				18

2. Cleaning

Regular cleaning of the transport system parts is desirable but practically impossible. So make it a rule to carry out cleaning of the tape transport system whenever the machine is serviced.

When the video head, tape guide and/or brush get soiled, the playback picture may appear inferior or at worst disappear, resulting in possible tape damage.

(1) When cleaning the upper drum (especially the video head), soak a piece of closely woven cloth or Kimu-wipe with alcohol and while holding the cloth onto the upper drum by the fingers, turn the upper drum counterclockwise.

Note: ***Absolutely avoid sweeping the upper drum vertically as this will cause damage to the video head.***

(2) To clean the parts of the tape transport system other than the upper drum, use a piece of closely woven cloth or a cotton swab soaked with alcohol.

(3) After cleaning, make sure that the cleaned parts are completely dry before using the video tape.

3. Lubrication

With no need for periodical lubrication, you have only to lubricate new parts after replacement. If any oil or grease on contact parts is soiled, wipe it off and newly lubricate the parts.

(1) See the mechanism assembly and disassembly diagrams (M4) for the lubricating or greasing spots. See Table 2-1-2 for the types of oil or grease to be used.

Type	Name	Serial No.	Symbols on the disassembly diagrams
Grease	Maltemp SH-P	KYODO-SH-P	AA
Oil	Cosmohydro HV56	COSMO-HV56	BB

Table 2-1-2 Grease and oil used for the unit

4. Suggested servicing schedule for main components

The following table indicates the suggested period for such service measures as cleaning,lubrication and replacement. In practice, the indicated periods will vary widely according to environmental and usage conditions.However, the indicated components should be inspected when a set is brought for service and the maintenance work performed if necessary. Also note that rubber parts may deform in time,even if the set is not used.

System	Parts Name	Operation Hours	
		~1000H	~2000H
Tape transport	Upper drum assembly	★○	○
	A/C head	★○	★○
	Lower drum assembly	★	★○
	Pinch roller arm assembly	★	★
	Full erase head	★	★
	Tension arm assembly	★	★
	Capstan motor (Shaft)	★	★
	Guide arm assembly	★	★
Drive	Capstan motor		○
	Capstan brake assembly		○
	Main brake assembly		○
	Belt (Capstan)	○	○
	Belt (Loading motor)		○
	Loading motor		○
	Clutch unit		○
	Worm gear		○
	Control plate		○
Other	Brush	★○	★○
	Tension brake assembly	○	○
	Rotary encoder		○

★: Cleaning

○: Inspection or Replacement if necessary

Table 2-1-3

2.2 REPLACEMENT OF MAJOR PARTS

2.2.1 Before Starting Disassembling (Phase matching between mechanical parts)

The mechanism of this unit is closely linked with the rotary encoder and system controller circuits.

Since the system controller detects the status of mechanical operation in response to phases of the rotary encoder (internal switch positions), the mechanism may not operate properly unless such parts as the rotary encoder, control plate, loading arm gear, control cam, cassette gear, limit gear, relay gear and drive gear are installed in their correct positions.

Especially, this model is not provided with any cassette housing assembly, so that cassette loading and unloading must be accomplished by operation of the cassette holder assembly. The latter is in turn driven by such parts as the drive gear, relay gear and limit gear. Exercise enough care, therefore, to have the phases of all this gear matching one another.

(For information on phase matching of the mechanism, see the instructions on how to install individual parts.)

This unit is provided with a mechanism assembly mode. It is therefore necessary to enter this mode for assembling and disassembling procedures.
This mode is usually not in use, manually set it when it is required.

2.2.2 How to Set the Mechanism Assembling Mode

Remove the mechanism assembly and place it bottom side up. (See SECTION 1 DISASSEMBLY.) Turn the worm gear toward the front so that the guide hole of the control cam is brought into alignment with the hole at the mechanism assembly chassis. This position renders the mechanism assembling mode operational. Make sure that the control plate is located in alignment with the mark E. (See Fig.2-2-1.)

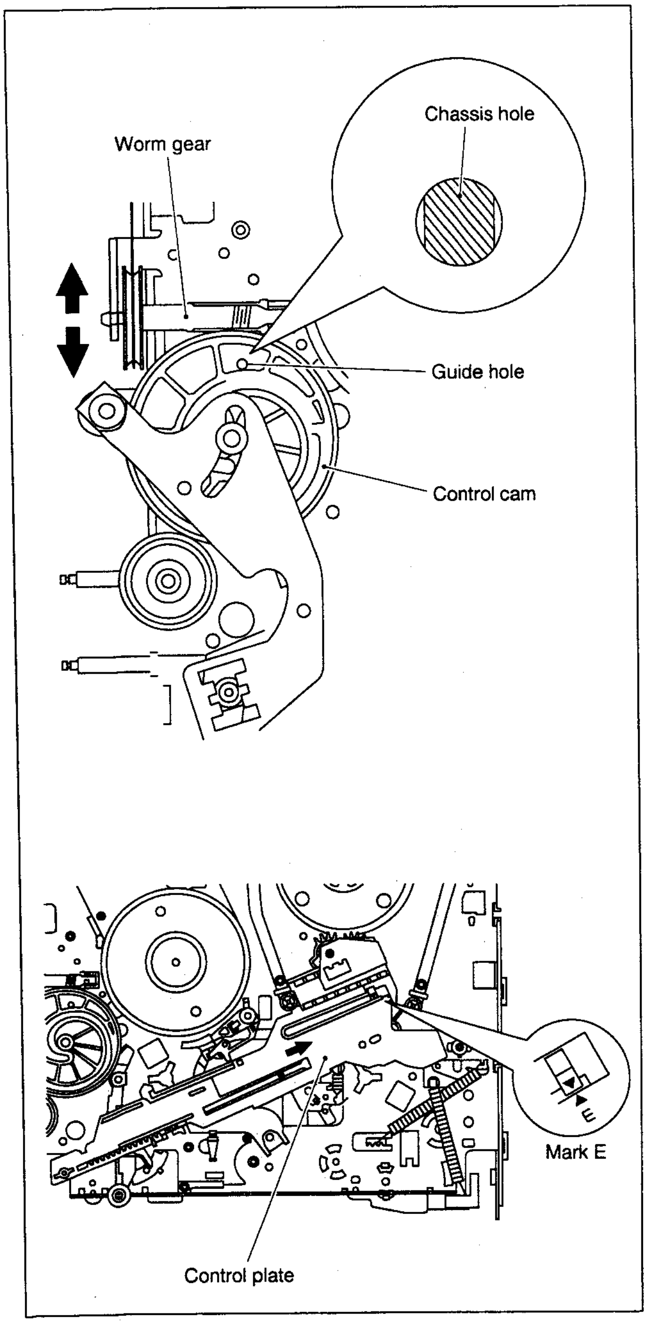

Chassis hole
Worm gear
Guide hole
Control cam
E
Mark E
Control plate

Fig. 2-2-1

2.2.3 Cassette Holder Assembly

1. How to remove

(1) Remove the guide rail and roller cam assembly. (See Fig.2-2-2.)
(3 lugs on the guide rail and one lug on the roller cam assembly)

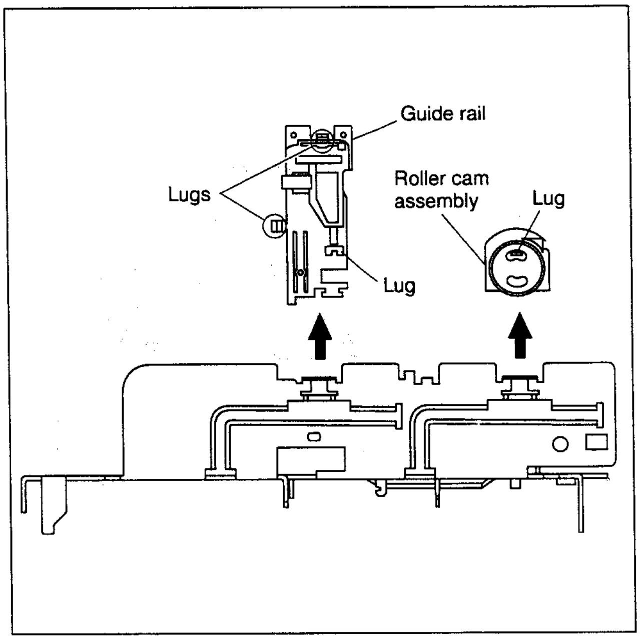

Guide rail
Lugs
Roller cam assembly
Lug
Lug

Fig. 2-2-2

(2) Remove the two slit washers and remove the cassette housing bracket. (See Fig.2-2-3.)
(3) Remove the opener guide, spring(A), door opener, relay gear and limit gear. (See Fig.2-2-3.)

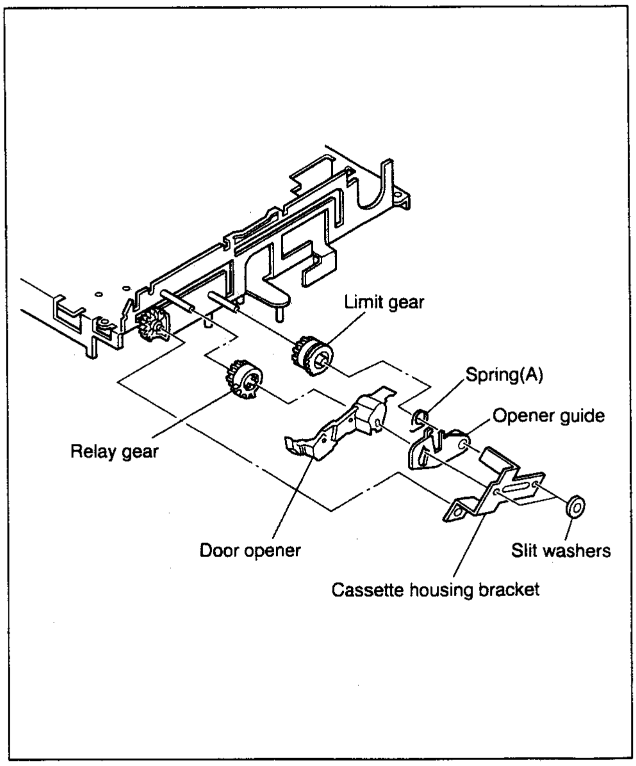

Limit gear
Spring(A)
Opener guide
Relay gear
Door opener
Slit washers
Cassette housing bracket

Fig. 2-2-3

(4) While swinging the lock levers (R) and (L) of the cassette holder assembly toward the front, slide the cassette holder assembly until its legs come to where the guide rail and the roller cam assembly have been removed (so that the drive arm is upright). (See Fig.2-2-4.)

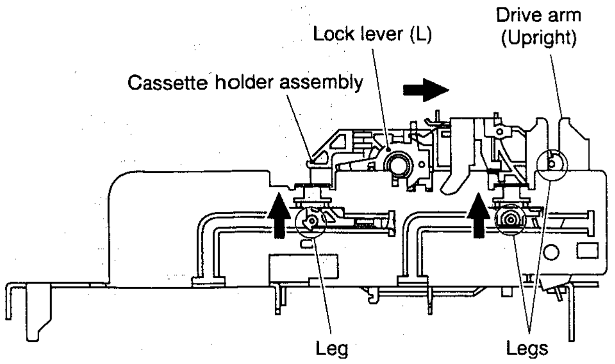

Drive arm
(Upright)
Lock lever (L)
Cassette holder assembly
Leg
Legs

Fig. 2-2-4

(5) While holding the left side of the cassette holder, lift the cassette holder assembly so that the three legs on the left side are all released. Then pull the legs Ⓐ and Ⓑ on the right side out of the rail and also pull up the leg Ⓒ. (See Fig.2-2-5 and Fig.2-2-6.)

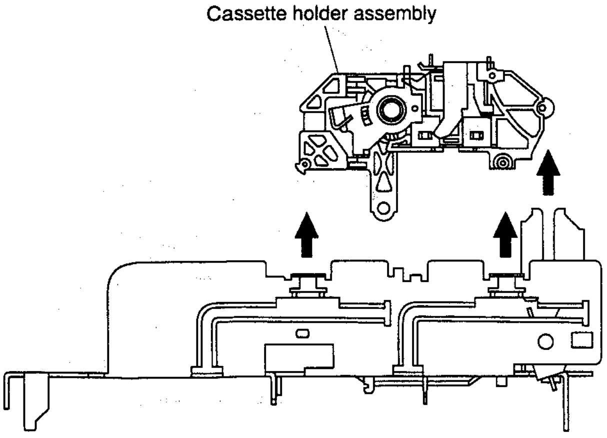

Cassette holder assembly

Fig. 2-2-5

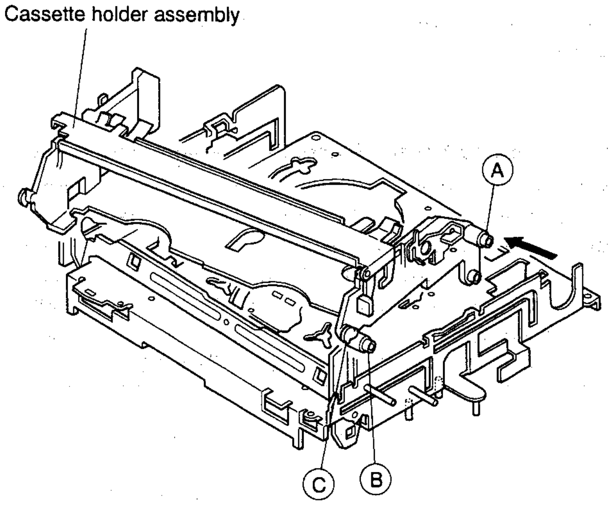

Cassette holder assembly
Ⓐ
Ⓒ
Ⓑ

Fig. 2-2-6

(6) Draw out the drive gear, and remove the drive arm.

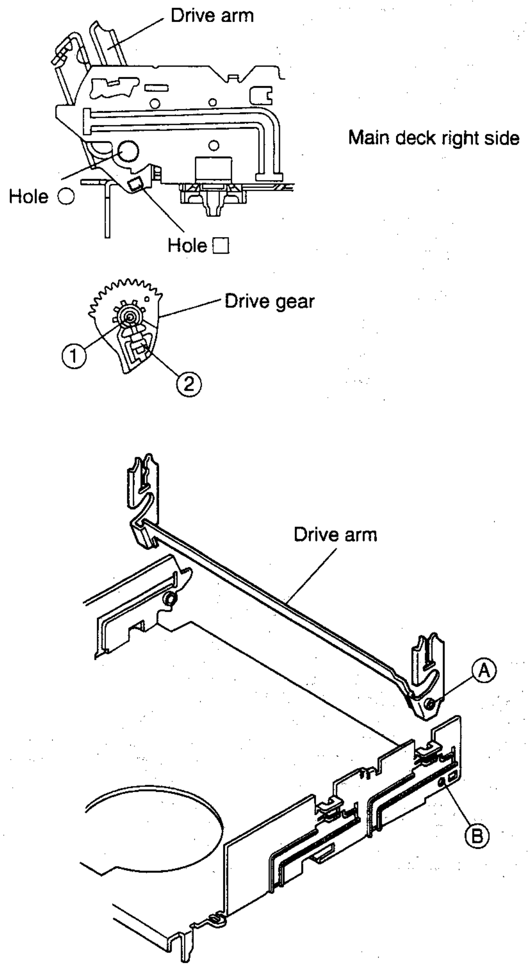

Drive arm
Main deck right side
Hole ○
Hole □
Drive gear
①
②
Drive arm
Ⓐ
Ⓑ

Fig. 2-2-7

2. How to install (Phase matching)

(1) Insert the section Ⓐ of the drive arm into the section Ⓑ of the main deck.

(2) Insert the section ① of the drive gear into the round hole, and the section ② into the square hole on the drive arm. (See Fig.2-2-7.)

(3) Hold the drive arm upright and fit the leg Ⓒ on the right side of the cassette holder assembly into the groove. (See Fig.2-2-8.)

(4) While swinging the lock lever (R) of the cassette holder assembly toward the front, put the legs Ⓐ and Ⓑ into the rail. (See Fig.2-2-8.)

(5) Drop the three legs on the left side of the cassette holder assembly into the groove at one time. (See Fig.2-2-9.)

(6) Slide the whole cassette holder assembly toward the front to bring it to the eject end position.

(7) Install the limit gear so that the notch on the outer circumference of the limit gear is brought into alignment with the guide hole on the main deck. (See Fig.2-2-10.)

(8) Install so that the notch on the periphery of the relay gear is aligned with the notch of the main deck and that hole A of the relay gear is aligned with the hole A of the limit gear and that hole B of the relay gear is aligned with the hole B of the drive gear. (See Fig.2-2-10.)

(9) Install the door opener, opener guide, spring(A) and cassette housing bracket and fasten the two slit washers.

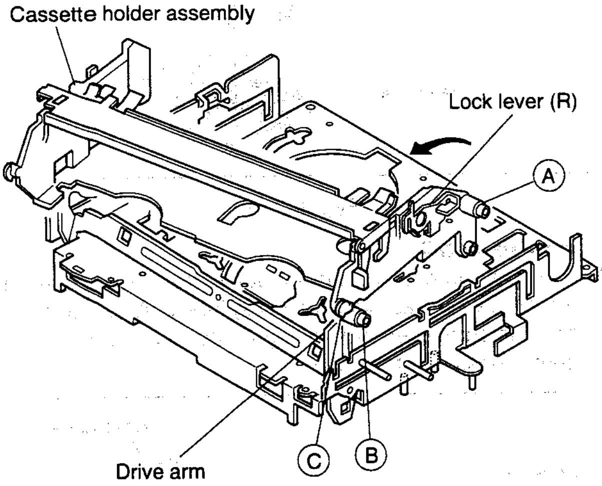

Cassette holder assembly
Lock lever (R)
Ⓐ
Drive arm
Ⓒ
Ⓑ

Fig. 2-2-8

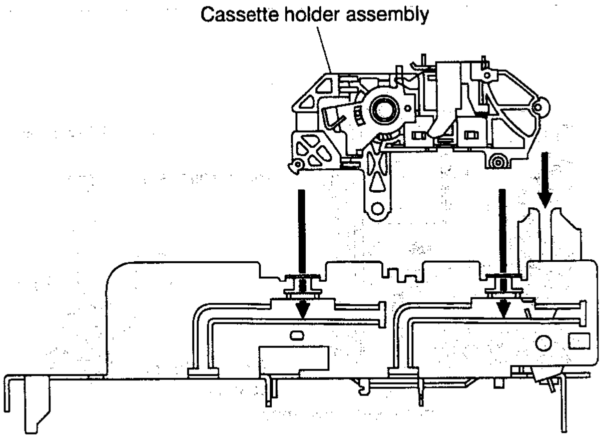

Cassette holder assembly

Fig. 2-2-9

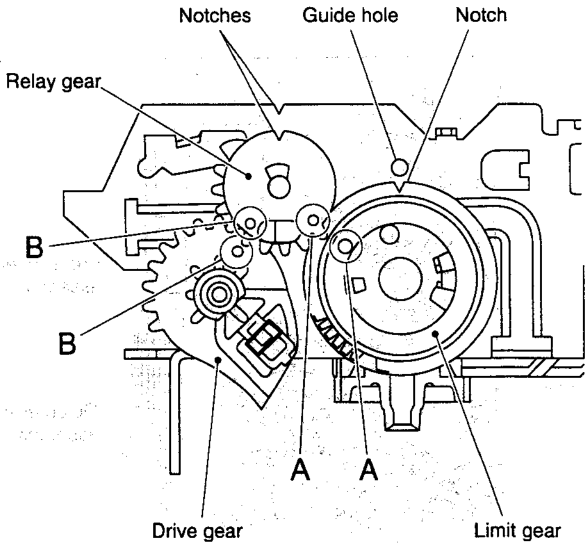

Notches
Guide hole
Notch
Relay gear
B
B
A
A
Drive gear
Limit gear

Fig. 2-2-10

2.2.4 Pinch Roller Arm Assembly

1. How to remove

(1) Remove the spring from the hook of the press lever assembly.

(2) Remove the slit washer and remove the pinch roller seat 2. (See Fig.2-2-11.)

(3) Remove the pinch roller arm assembly by pulling it up.

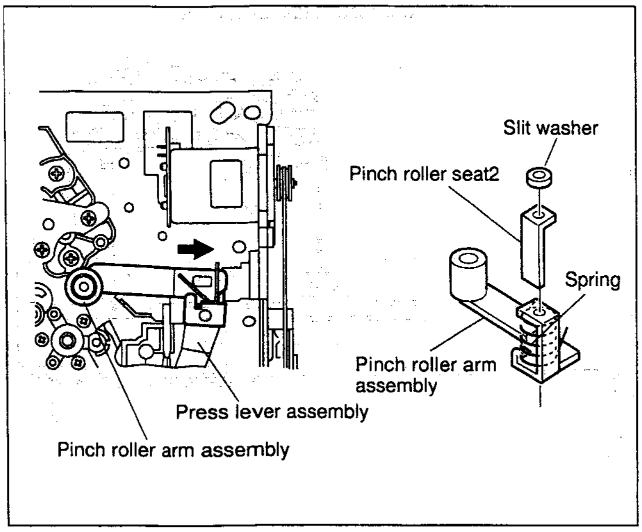

Slit washer
Pinch roller seat2
Spring
Pinch roller arm assembly
Press lever assembly
Pinch roller arm assembly

Fig. 2-2-11

2.2.5 Guide Arm Assembly and Press Lever Assembly

1. How to remove

(1) Remove the spring and expand the lug of the lid guide in the arrow-indicated direction. Then remove the guide arm assembly by pulling it up.

(2) Remove the press lever assembly by pulling it up. (See Fig.2-2-12.)

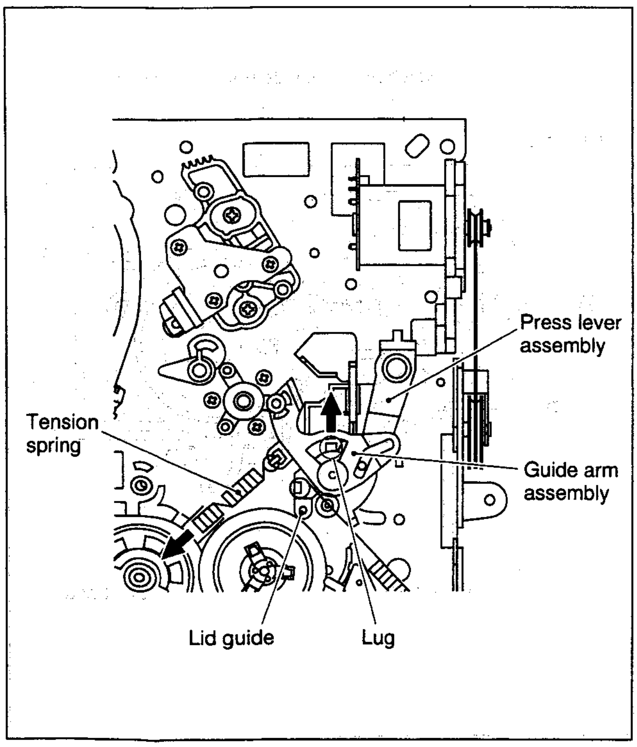

Press lever assembly
Tension spring
Guide arm assembly
Lid guide
Lug

Fig. 2-2-12

2.2.6 Audio Control Head

1. How to remove

(1) Remove the two screws (A) and remove the audio control head together with the head base.

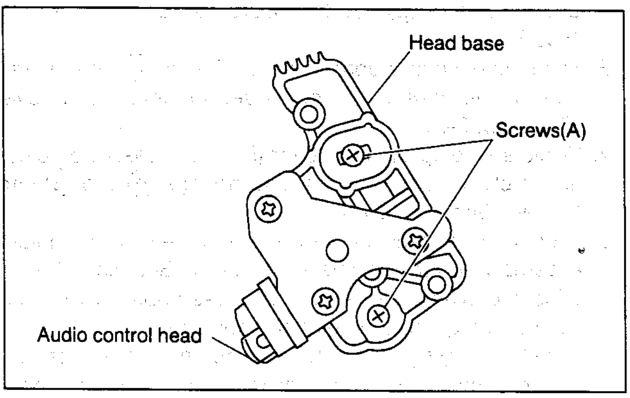

Head base
Screws(A)
Audio control head

Fig. 2-2-13

(2) When replacing only the audio control head, remove the three screws (B) while controlling the compression spring.

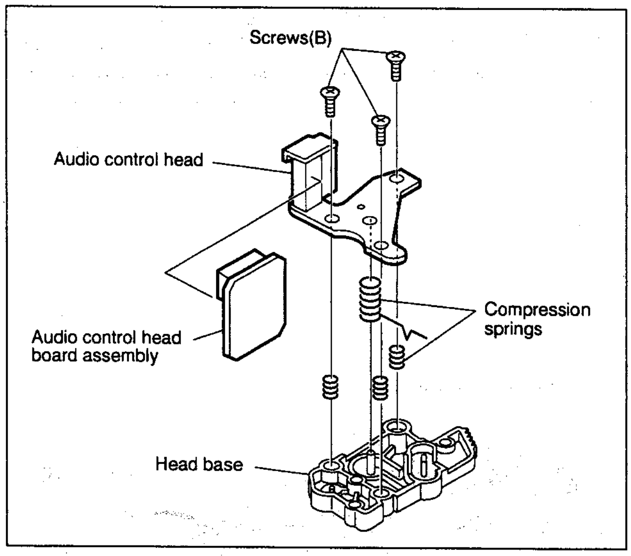

Screws(B)
Audio control head
Compression springs
Audio control head board assembly
Head base

Fig. 2-2-14

2. How to install

(1) To make the post-installation adjustment easier, set the temporary level as indicated in Fig.2-2-15. Also make sure that the screw center is brought into alignment with the center position of the slot.

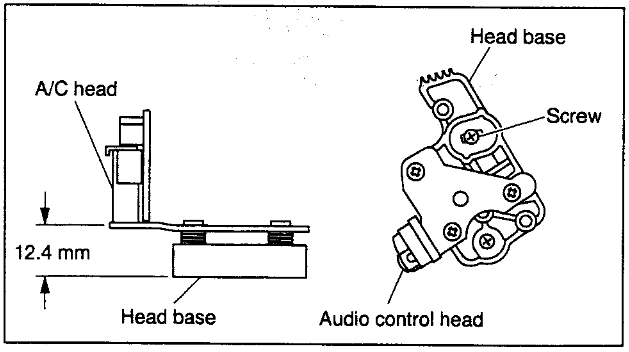

Head base
A/C head
Screw
12.4 mm
Head base
Audio control head

Fig. 2-2-15

2.2.7 Loading Motor

1. How to remove

(1) Remove the belt wound around the worm gear.

(2) Open the two lugs of the motor guide and remove the loading motor, loading motor board assembly and motor guide altogether by pulling them up.

(3) When replacing the loading motor board assembly, take care with the orientation of the loading motor. (Install so that the loading motor label faces upward.)

(4) When the motor pulley has been replaced, choose the fitting dimension as indicated in Fig.2-2-16.

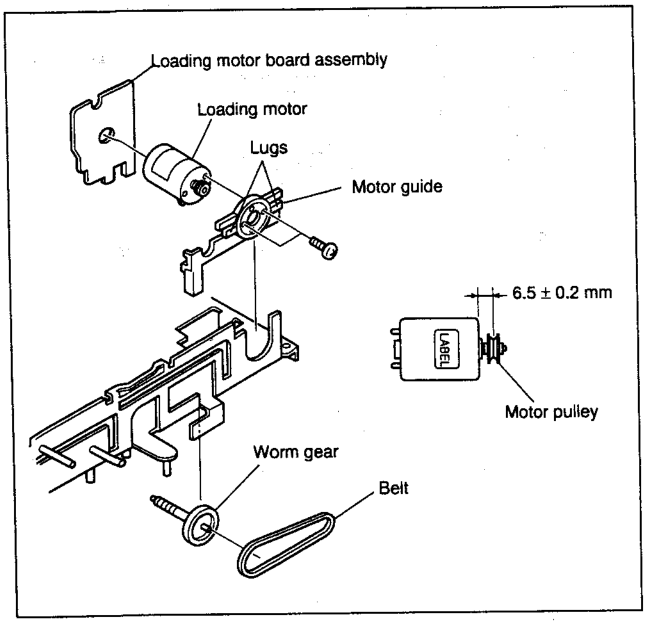


Fig. 2-2-16

2.2.8 Capstan Motor

1. How to remove

(1) Remove the belt (capstan) on the mechanism assembly back side.

(2) Remove the three screws (A) and remove the capstan motor.

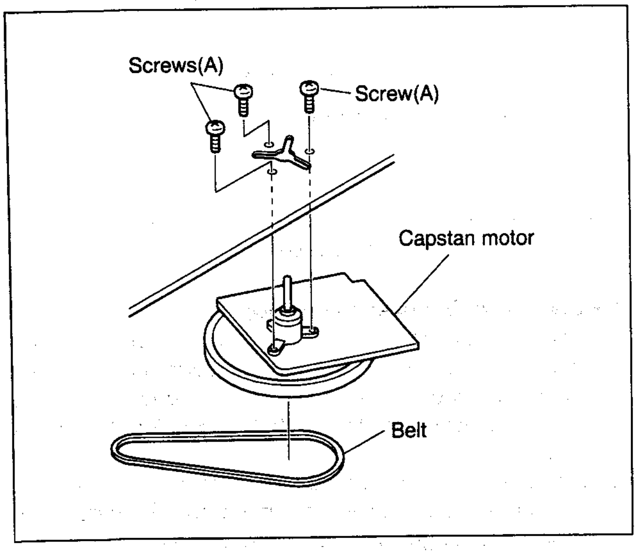


Fig. 2-2-17

2. How to install (Centering the mounting position)

When the capstan motor has once been removed and then reinstalled out of the initial correct position in the rotational direction, the capstan motor current may be unstable during operation in high or low temperatures. This may result in greater Wow & Flutter and occasionally in power breakdown because of current over - load. Install the capstan motor while following the procedure given below.

(The capstan motor is centrally located when the unit is shipped from the factory.)

(1) Provisionally tighten the three screws (A) securing the capstan motor.

(2) Install the mechanism assembly to which the capstan motor is provisionally fastened on the bottom chassis which incorporates the Main board assembly. (No need to tighten the screws for mounting the mechanism.) Make sure that all the connectors for the mechanism assembly and the Main board assembly are correctly installed as indicated in Fig. 2-2-18.

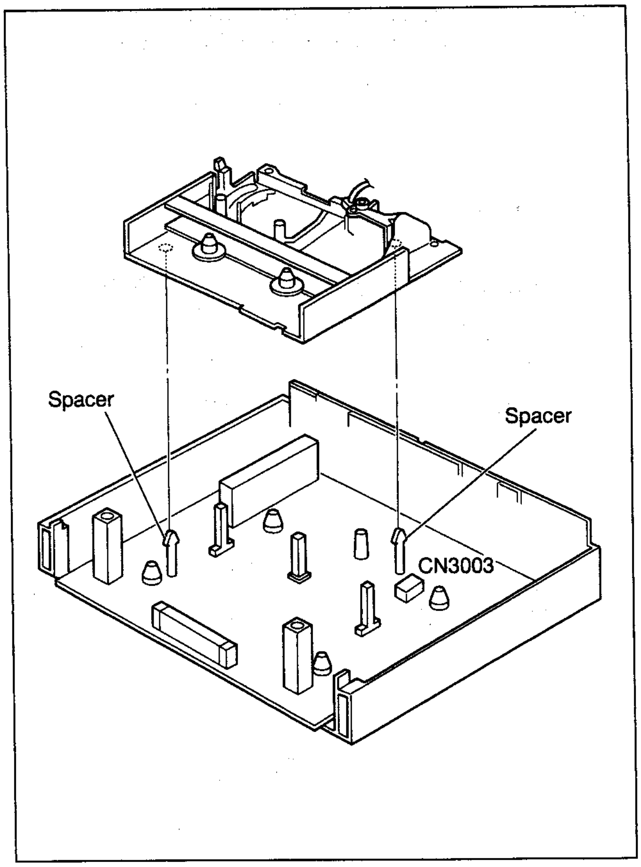


Fig. 2-2-18

(3) Making sure that the connector CN3003 of the capstan motor is correctly mounted, and securely tighten the three screws (A).

Note: ***When the capstan motor has been replaced with a new one, perform recording in the EP mode for at least 2 minutes at normal temperatures immediately before starting the FF/REW or SEARCH operations (Aging).***

2.2.9 Pole Base Assembly (supply or take-up side)

1. How to remove

1) Remove the UV catcher 2 on the removal side by loosening the screw (A).
2) Remove the pole base assembly on the supply side from the mechanism assembly by loosening the screw (B) on the mechanism assembly back side and sliding the pole base assembly toward the UV catcher 2.
3) As for the pole base assembly on the take-up side, turn the pulley of the loading motor to lower the cassette holder because the screw (B) is hidden under the control plate. (See the "Procedures for Lowering the Cassette holder assembly" of 1.3 DISASSEMBLY/ASSEMBLY METHOD.) Further turn the motor pulley to move the cassette holder until the screw (B) is no longer under the control plate (in the half-loading position). Then remove it as done for the supply side by removing the screw (B).

NOTE: *After reinstalling the Pole base assembly and the UV catcher2, be sure to perform compatibility adjustment.*

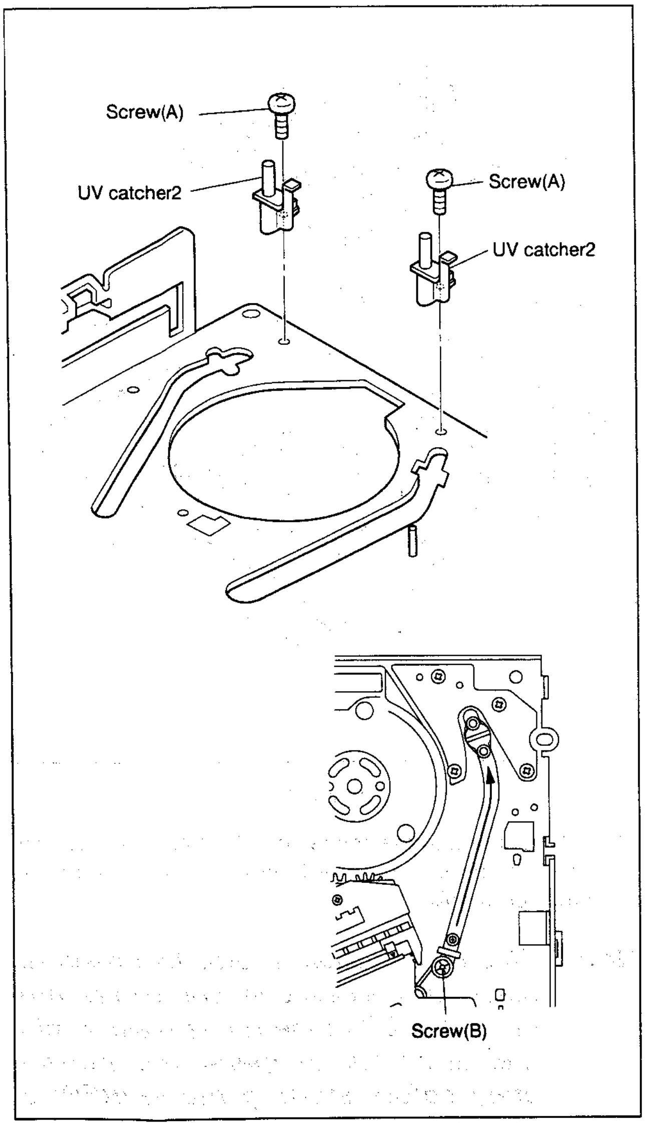

Screw(A)
UV catcher2
Screw(A)
UV catcher2
Screw(B)

Fig. 2-2-19

2.2.10 Rotary Encoder

1. How to remove

(1) Remove the screw (A) and remove the rotary encoder by pulling it up. (See Fig. 2-2-20.)

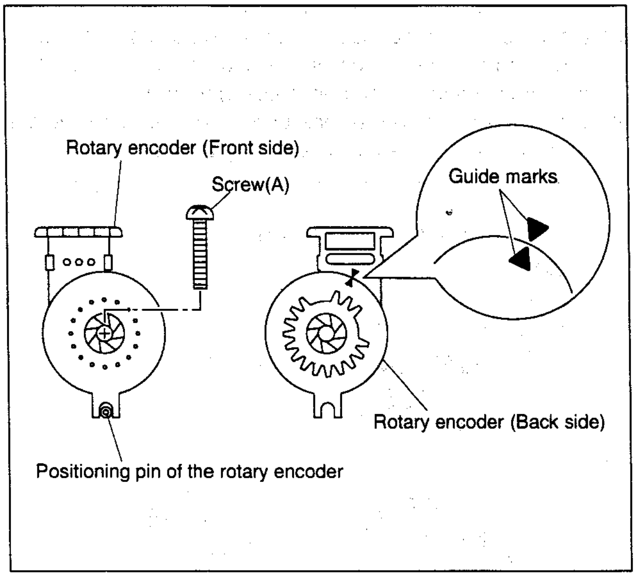

Rotary encoder (Front side)
Screw(A)
Guide marks
Rotary encoder (Back side)
Positioning pin of the rotary encoder

Fig. 2-2-20

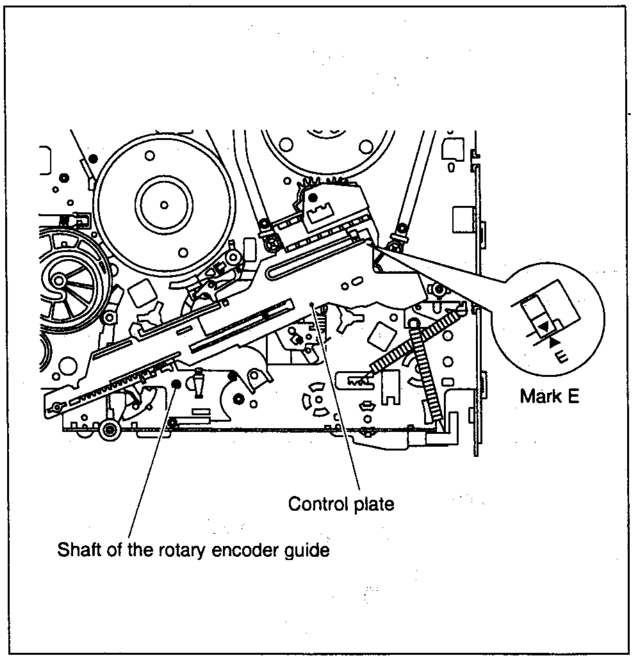

Mark E
E
Control plate
Shaft of the rotary encoder guide

Fig. 2-2-21

2. How to install (Phase matching)

(1) Make sure that the mark E of the control plate is in alignment with the mark ▼ of the loading arm gear shaft and bring the guide marks on the rotary encoder into alignment as indicated in Fig.2-2-20. (See Fig. 2-2-20 and Fig. 2-2-21.)
(2) Turn over the rotary encoder with its guide marks kept in alignment and install it by fitting on the shaft of the rotary encoder guide and the positioning pin.
(3) Tighten the screw (A) to complete the installation.

2.2.11 Clutch Unit

(1) Remove the belt wound around the capstan motor and the clutch unit.
(2) Remove the slit washer and remove the clutch unit.

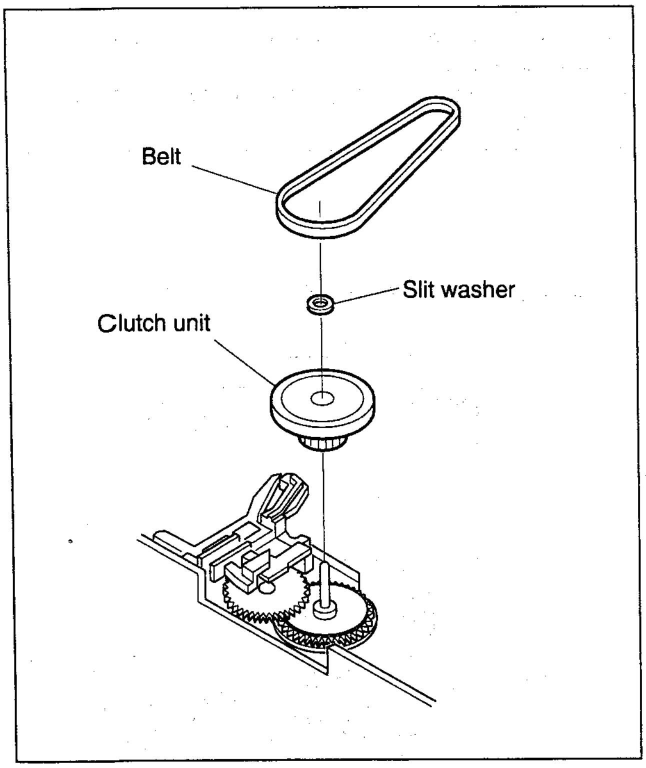

Belt
Slit washer
Clutch unit

Fig. 2-2-22

2.2.12 Change Lever Assembly, Direct Gear and Clutch Gear1

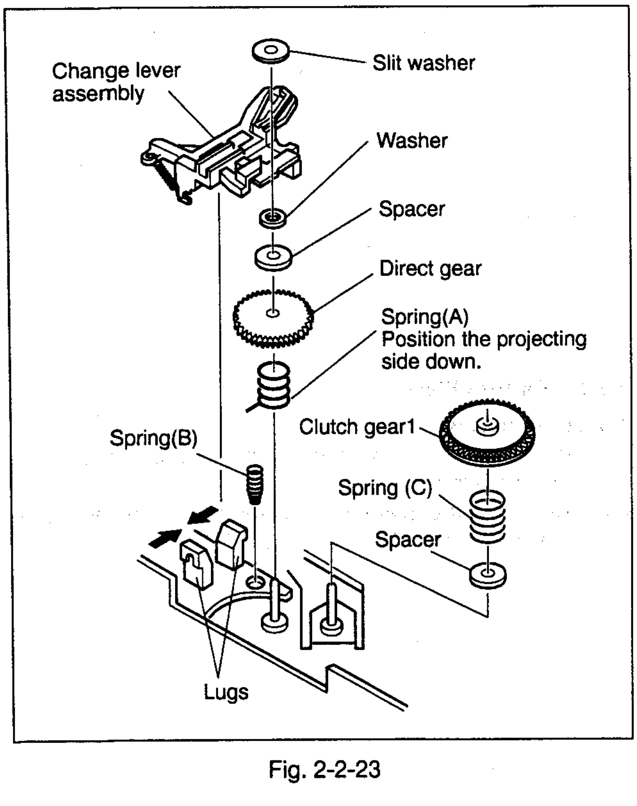

Change lever assembly
Slit washer
Washer
Spacer
Direct gear
Spring(A)
Position the projecting side down.
Spring(B)
Clutch gear1
Spring (C)
Spacer
Lugs

Fig. 2-2-23

1. How to remove

(1) Release the two lugs of the rotary encoder guide in the arrow-indicated direction and remove the change lever assembly.
(2) Remove the slit washer retaining the direct gear and remove the latter.
Take care so as not to lose the washer and spring. (See Fig.2-2-23.)

2. How to install

(1) Install the clutch gear1, spring (A), spring (C), direct gear, spacer and others to the individual shafts of the main deck, and finally the slit washer. (See Fig.2-2-23.)
(2) Let the spring (B) drops into the rotary encoder guide hole and install the change lever assembly.(Take care not to mistake a direction of the spring.) The point is to slightly lift the clutch gear1 and catch it from the both sides with the assembly. (See Fig.2-2-24.)

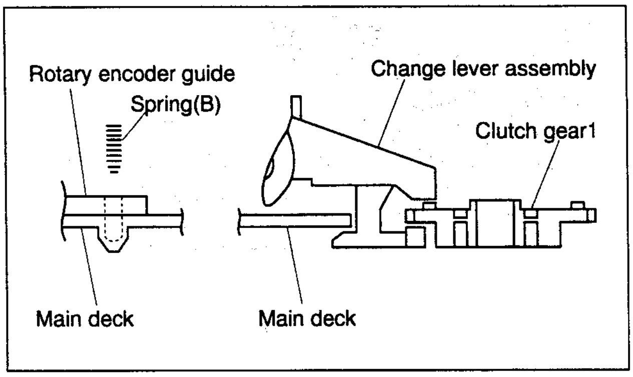

Rotary encoder guide
Spring(B)
Change lever assembly
Clutch gear1
Main deck
Main deck

Fig. 2-2-24

2.2.13 Link Lever

1. How to remove

(1) Remove the two slit washers.
(2) Remove the link lever by lifting it from the shaft retained by the slit washers. Then swing the link lever counterclockwise and remove it from the locking section of the control plate.

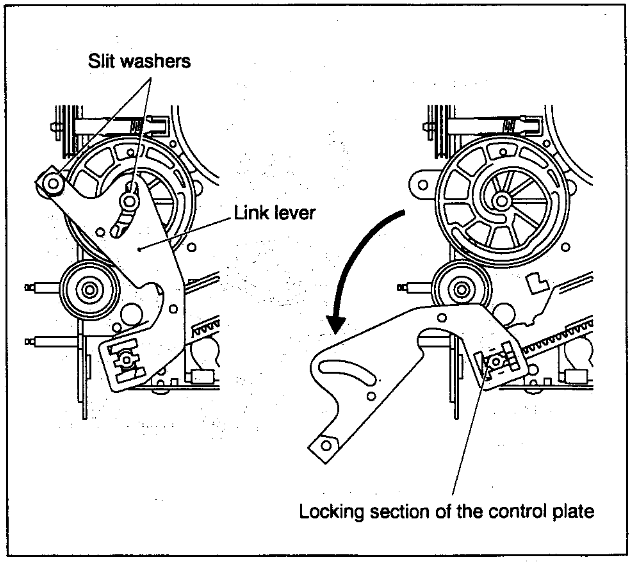

Slit washers
Link lever
Locking section of the control plate

Fig. 2-2-25

2. How to install (Phase matching)

1) Slide the control plate so that its mark E is aligned with the mark ▼ on the loading arm gear shaft. (See Fig.2-2-26.)
2) Rotate the worm gear until the guide hole of the control cam is aligned exactly with the guide hole of the main deck. (See Fig.2-2-27.)
3) Insert the link lever into the locking section of the control plate. (See Fig.2-2-25.)
4) Rotate the link lever clockwise so that it is installed on the shafts in the center and on the left of the control cam.
5) Fasten the slit washers at these two points.

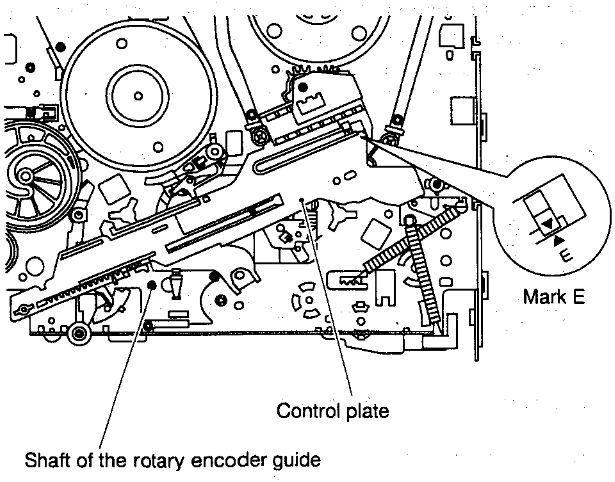

Mark E
Control plate
Shaft of the rotary encoder guide

Fig. 2-2-26

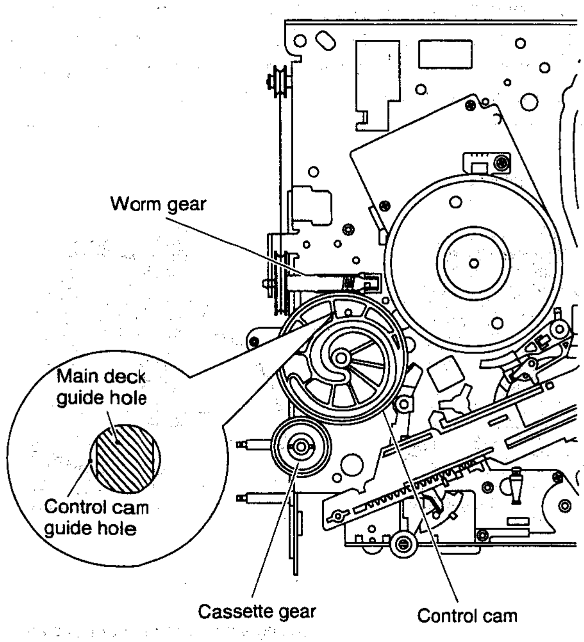

Worm gear
Main deck guide hole
Control cam guide hole
Cassette gear
Control cam

Fig. 2-2-27

2.2.14 Cassette Gear, Control Cam and Worm Gear

1. How to remove

(1) Remove the control cam by lifting it.
(2) Open the two lugs of the cassette gear outward and pull the latter off.
(3) Remove the belt wound around the worm gear and the loading motor.
(4) Open the lug of the lid guide outward and remove the worm gear.

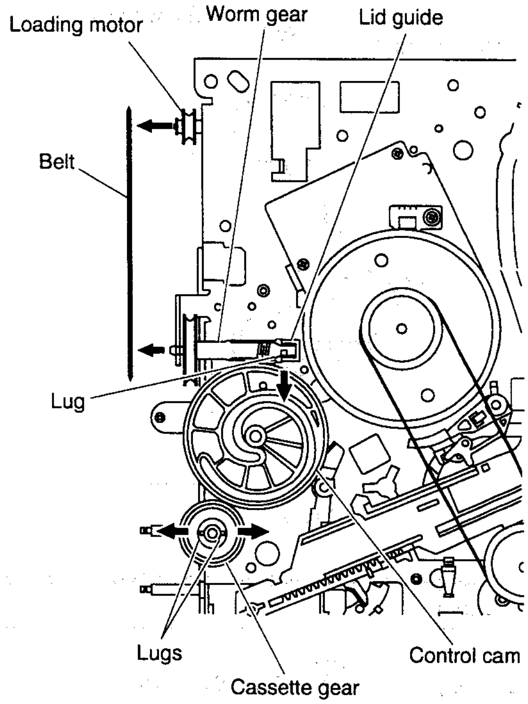

Loading motor
Worm gear
Lid guide
Belt
Lug
Lugs
Cassette gear
Control cam

Fig. 2-2-28

2.2.15 Control Plate

1. How to remove

(1) Remove the screw (A) retaining the control bracket 1 and remove the latter.
(2) Slide the control plate as indicated by the arrow and remove the control plate. (See Fig.2-2-29.)

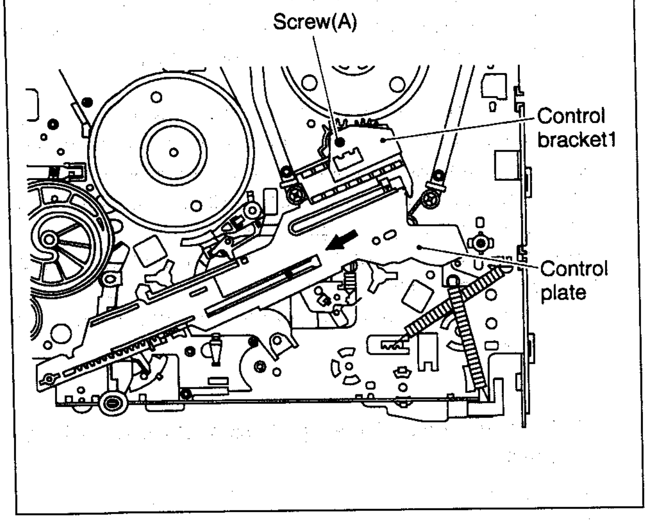

Screw(A)
Control bracket1
Control plate

Fig. 2-2-29

2. How to install (Phase matching)

(1) Adjust the position of the idler arm assembly pin as indicated in Fig.2-2-30 (to the left of centre of the R section).

(2) Bring the guide hole of the take-up lever into alignment with the hole at the control plate guide and fix the position by inserting a 1.5 mm hexagonal wrench.

(3) Install the control plate so that the section A of the loading arm gear shaft fits into the hole (A) of the control plate, the section B of the control plate guide into the hole (B), and the control plate comes under the section C of the rotary encoder guide and the section D of the loading arm gear shaft while press-fit the pole base assmebly (supply side) as indicated by the arrow. It is important that the tension arm assembly shaft is positioned closer toward you than the control plate. (See Fig.2-2-31.)

(4) Make sure that the mark E of the control plate is in alignment with the mark ▼ of the loading arm gear shaft. (See Fig.2-2-31.)

(5) Pull off the hexagonal wrench for positioning.

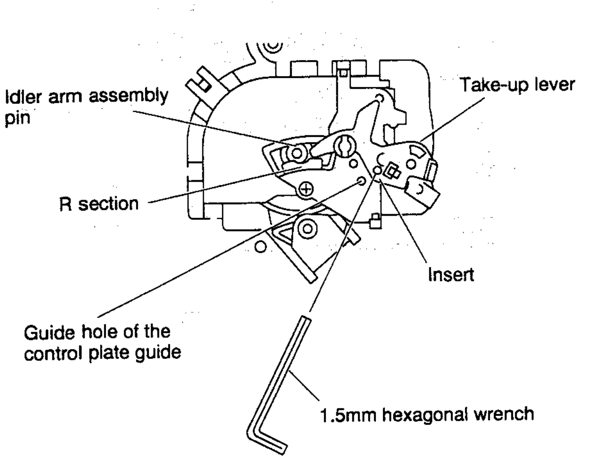

Idler arm assembly pin
Take-up lever
R section
Insert
Guide hole of the control plate guide
1.5mm hexagonal wrench

Fig. 2-2-30

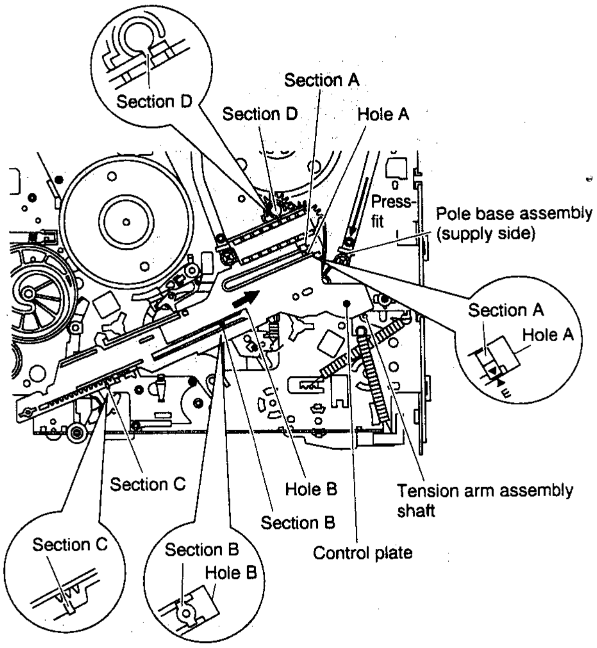

Section D
Section A
Section D
Hole A
Press-fit
Pole base assembly (supply side)
Section A
Hole A
E
Section C
Hole B
Tension arm assembly shaft
Section B
Section C
Section B
Hole B
Control plate

Fig. 2-2-31

2.2.16 Loading Arm Gear (supply or take-up side) and Loading Arm Gear Shaft

1. How to remove

(1) Remove the loading arm gear (supply side) by loosening the screw (A). (See Fig. 2-2-32.)

(2) Remove the screw (B) and remove the torsion arm from the pole base assembly (take-up side). (See Fig.2-2-32.)

(3) Turn the loading arm gear (take-up side) clockwise so that the notch of the loading arm gear (take-up side) is in alignment with the projection of the loading arm gear shaft and lift it.
Likewise, turn the loading arm counterclockwise so that the notch is in alignment with the projection and remove the loading arm gear (take-up side). (See Fig.2-2-32 and Fig. 2-2-33.)

(4) When removing the loading arm gear shaft, be sure of first removing the screw retaining the drum assembly (on the back side of the loading arm gear shaft). Then remove the screw (C) and remove the loading arm gear shaft by sliding it.

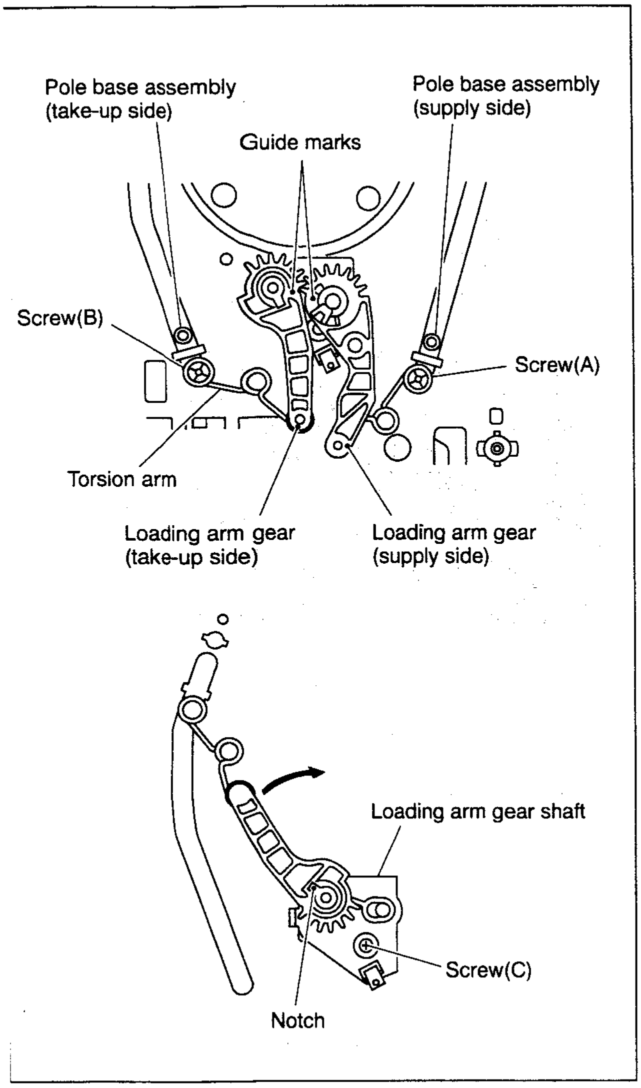

Pole base assembly
(take-up side)
Pole base assembly
(supply side)
Guide marks
Screw(B)
Screw(A)
Torsion arm
Loading arm gear
(take-up side)
Loading arm gear
(supply side)
Loading arm gear shaft
Screw(C)
Notch

Fig. 2-2-32

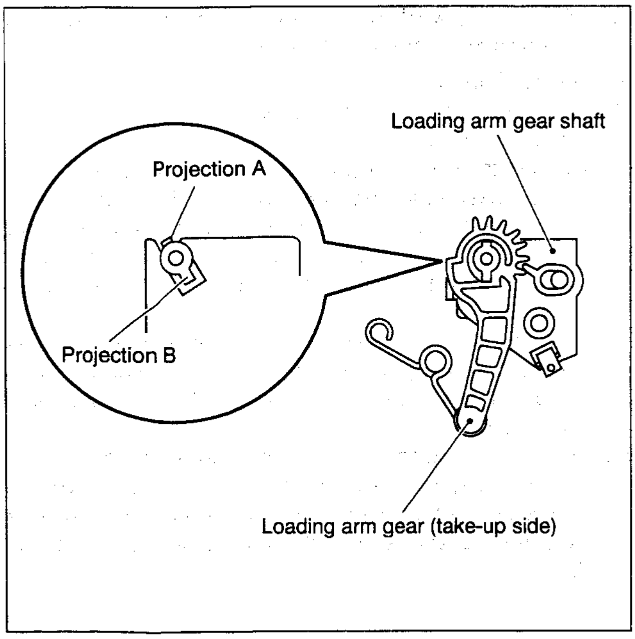

Loading arm gear shaft
Projection A
Projection B
Loading arm gear (take-up side)

Fig. 2-2-33

2. How to install

(1) Align the notch of the loading arm gear (take-up side) to the projection B of the loading arm gear shaft and slip it over. Then rotate it clockwise for alignment with the projection A and slip it down to the bottom. (See Fig.2-2-33.)

(2) Then turn the loading arm gear (take-up side) counterclockwise. Hang the torsion arm on the pole base assembly (take-up side) and tighten the screw (B).

(3) Install the loading arm gear (supply side) so that the guide mark of the loading arm gear (take-up side) is in alignment with the guide mark of the loading arm gear (supply side). Then hang the torsion arm on the pole base assembly (supply side) and tighten the screw (A). (See Fig.2-2-32.)

2.2.17 Take-up Lever, Take-up Head and Control Plate Guide

(1) Remove the spring of the take-up lever from the main deck.

(2) Remove the lug (A) of the take-up lever from the main deck and pull out the take-up lever and the take-up head together.

(3) Remove the screw (A).

(4) Align the idler arm assembly pin in the center of the R section of the control plate guide, remove the control plate guide lugs (B) and (C) from the main deck, and remove the control plate guide.

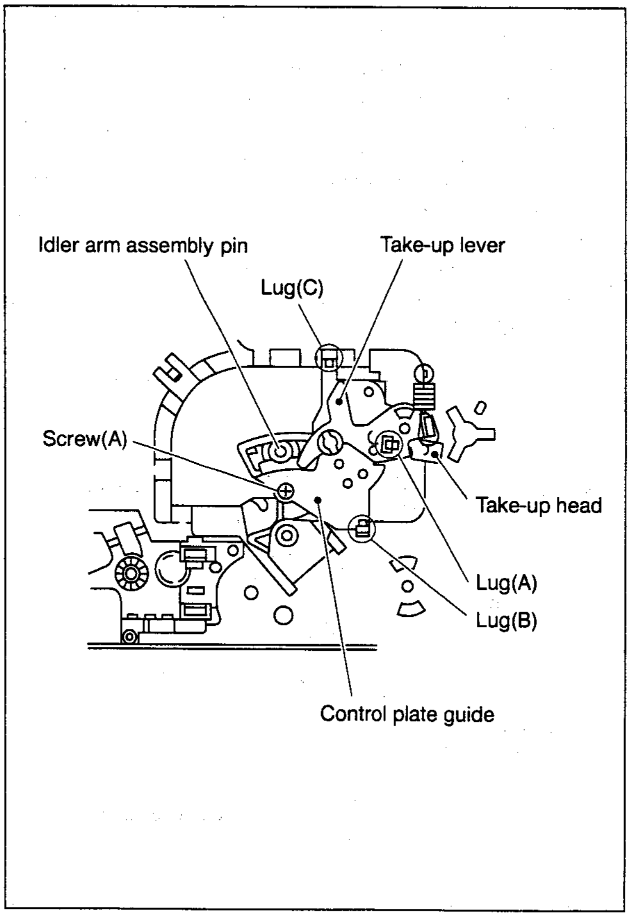

Idler arm assembly pin
Take-up lever
Lug(C)
Screw(A)
Take-up head
Lug(A)
Lug(B)
Control plate guide

Fig. 2-2-34

2.2.18 Capstan Brake Assembly

1. How to remove

(1) Move the lug (A) of the capstan brake assembly in the arrow-indicated direction so that it comes into alignment with the notch of the main deck. (See Fig. 2-2-35.)

(2) Remove the lug (B) of the capstan brake assembly from the main deck and remove the capstan brake assembly.

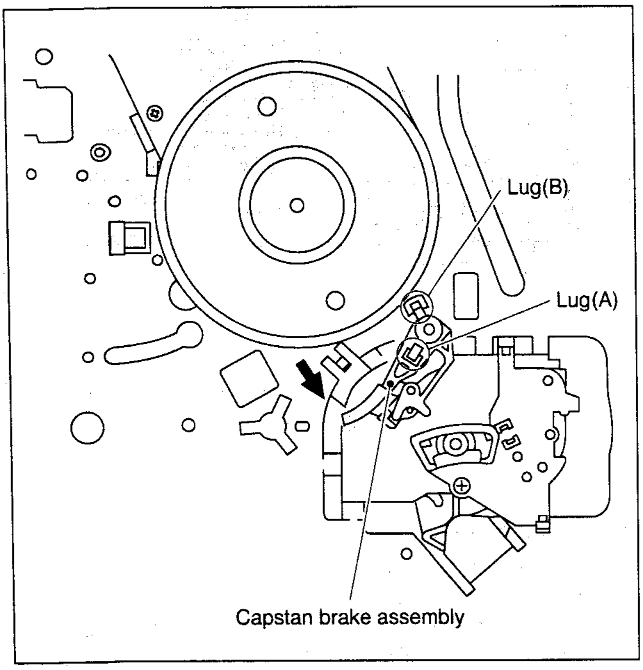

Lug(B)
Lug(A)
Capstan brake assembly

Fig. 2-2-35

2.2.19 Sub Brake Assembly (take-up side)

1. How to remove

(1) Remove the spring attached to the lid guide and sub brake assembly (take-up side).

(2) Bring the lug (A) of the sub brake assembly (take-up side) into alignment with the notch of the main deck.

(3) Remove the lugs (B) and (C) of the sub brake assembly (take-up side) from the main deck and remove the sub brake assembly (take-up side).

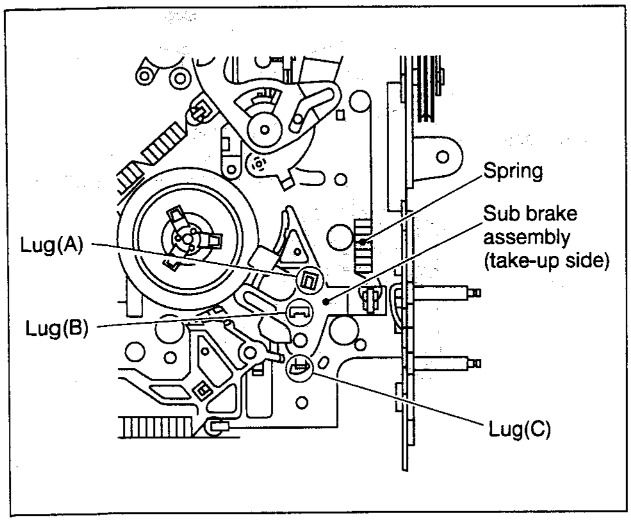

Spring
Sub brake assembly (take-up side)
Lug(A)
Lug(B)
Lug(C)

Fig. 2-2-36

2.2.20 Main Brake Assembly (take-up side), Reel Disk (take-up side) and Main Brake Assembly (supply side)

1. How to remove

(1) Move the main brake assembly (take-up side) in the arrow-indicated direction and remove the reel disk (take-up side).

(2) Remove the spring attached to the main brake assembly.

(3) Remove the lug (A) of the main brake assembly (take-up side) and pull out the lug (B) after bringing it into alignment with the main deck notch.

(4) Remove the lugs (C), (D) and (E) of the main brake assembly (supply side) from the main deck and pull them off. (See Fig.2-2-37.)

Note: *If the main brake assembly is difficult to remove, press it and hold the adjustment pin from the back side of the main deck when attempting to remove it.*
After the adjustment pin has been removed or the main brake assembly or the reel disk on the supply or take-up side have been replaced, it is required to adjust the main brake assembly torque. See page 2-23 for the detailed adjustment procedures.

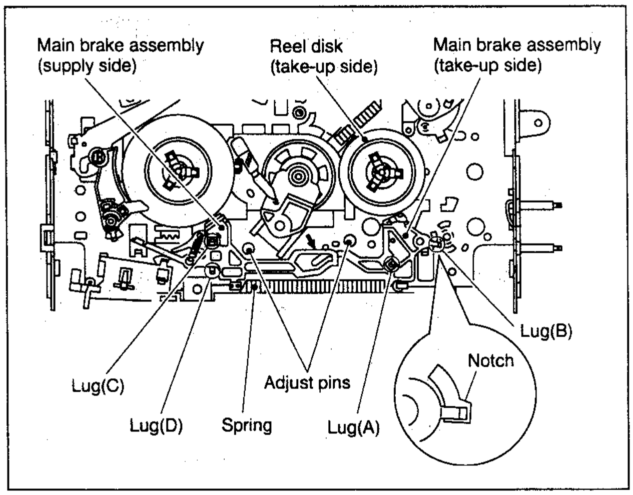

Main brake assembly (supply side)
Reel disk (take-up side)
Main brake assembly (take-up side)
Lug(B)
Notch
Lug(C)
Adjust pins
Lug(D)
Spring
Lug(A)

Fig. 2-2-37

(5) When installing the main brake assembly (take-up side), slide the brake lever in the direction as indicated by the arrow to prevent it from hitting the projection of the main brake assembly (take-up side). (See Fig.2-2-38.)

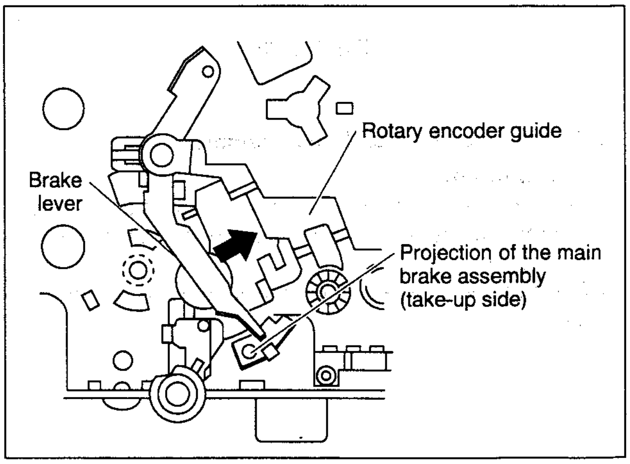

Rotary encoder guide
Brake lever
Projection of the main brake assembly (take-up side)

Fig. 2-2-38

2.2.21 Tension Brake Assembly, Reel Disk (supply side) and Tension Arm Assembly

1. How to remove

(1) Remove the three lugs of the tension brake assembly from the main deck and pull them off.

(2) Remove the reel disk (supply side) by loosening in the arrow-indicated direction the main brake assembly (supply side).

(3) Remove the tension spring on the back of the main deck. Then release the lug of the tension arm bearing in the arrow-indicated direction and draw out the tension arm assembly. (See Fig. 2-2-39.)

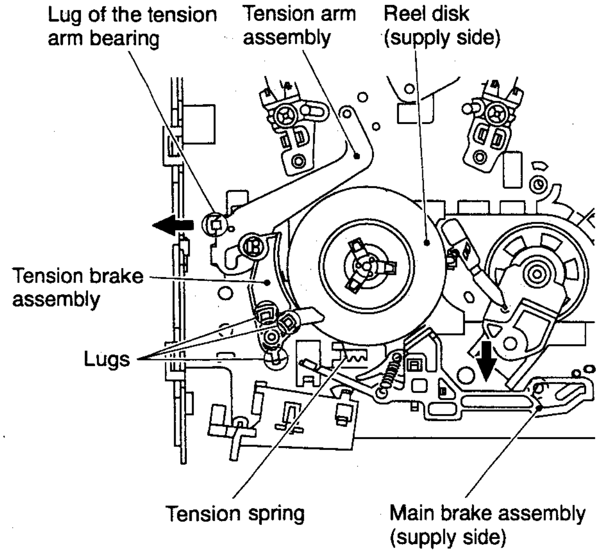

Lug of the tension arm bearing
Tension arm assembly
Reel disk (supply side)
Tension brake assembly
Lugs
Tension spring
Main brake assembly (supply side)

Fig. 2-2-39

2.2.22 Idler Lever, Idler Arm Assembly

1. How to remove

(1) Remove the lug of the idler lever from the main deck and remove the hook fitted in the idler arm assembly hole by lifting it.

(2) Remove the slit washer and pull out the idler arm assembly.

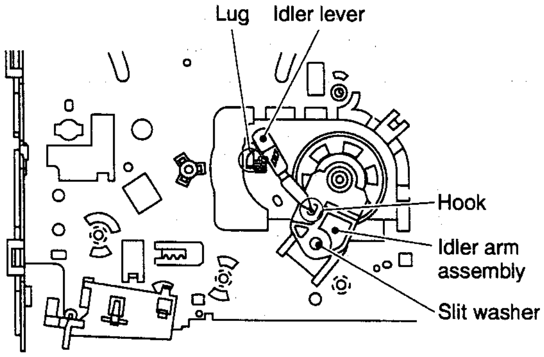

Lug
Idler lever
Hook
Idler arm assembly
Slit washer

Fig. 2-2-40

2.2.23 Stator Assembly

(1) Remove the flat cable.

(2) Remove the two screws (A).

(3) Remove the stator assembly by lifting in the arrow-indicated direction. (Take care that the brush spring does not jump out.)

(4) After installation, be sure to perform the PB switching point adjustment according to the electrical adjustment procedure.

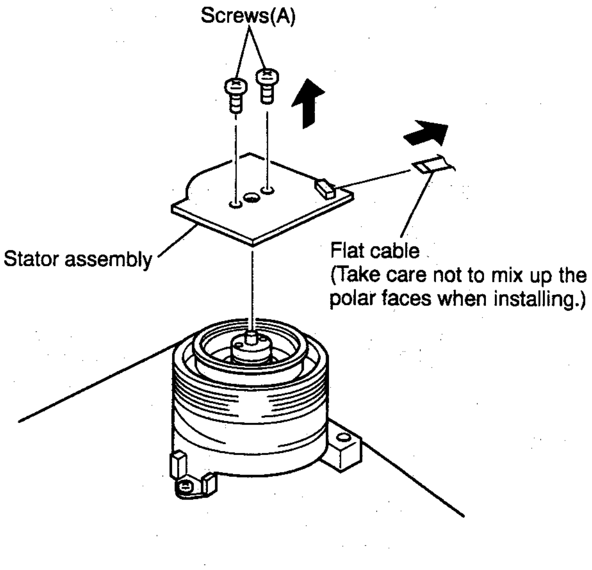

Screws(A)
Stator assembly
Flat cable
(Take care not to mix up the polar faces when installing.)

Fig. 2-2-41

2.2.24 Rotor Assembly

(1) Remove the stator assembly.
(2) Remove the two screws (B) and remove the rotor assembly.

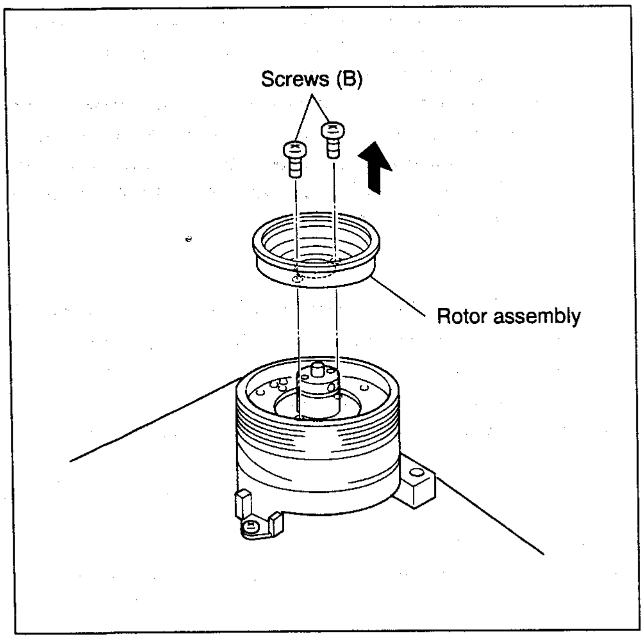

Screws (B)
Rotor assembly

Fig. 2-2-42

Note: *When installing the rotor assembly, note that a normal picture cannot be obtained without ensuring the phase matching as mentioned below.*

(3) Match the phases of the upper drum assembly and the rotor assembly as indicated in Fig.2-2-43.
(4) Place the upper drum assembly hole (a) over the rotor assembly holes (b) (with three holes to be aligned) and tighten the two screws (B). (See Fig.2-2-43.)

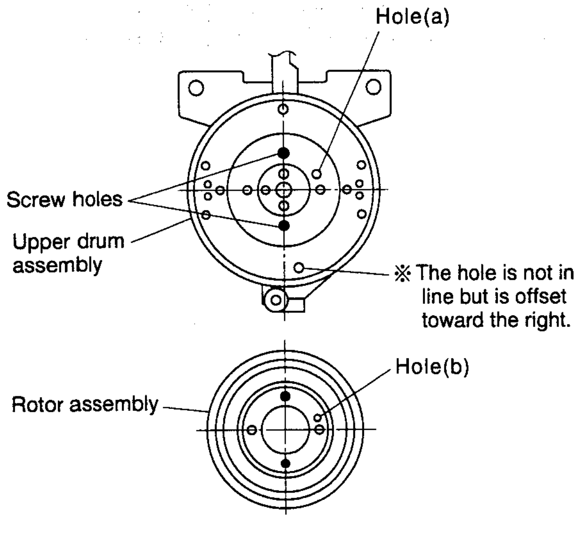

Hole(a)
Screw holes
Upper drum assembly
※The hole is not in line but is offset toward the right.
Hole(b)
Rotor assembly

Fig. 2-2-43

2.2.25 Upper Drum Assembly

1. How to remove

(1) Remove the stator assembly and rotor assembly.
(2) Loosen the screw of the collar assembly using a 1.5 mm hexagonal wrench and remove the collar assembly. Also remove the brush, spring and cap at one time.
(3) Remove the upper drum assembly and remove the washer using tweezers.

Note: *When replacement is required, control the up-down movement of the brush. Never apply grease.*

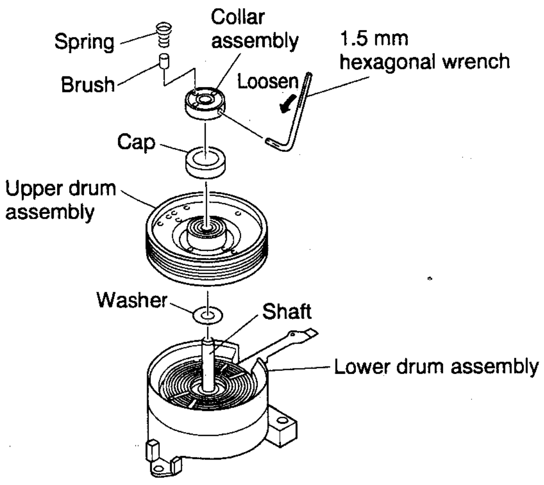

Spring
Collar assembly
1.5 mm hexagonal wrench
Brush
Loosen
Cap
Upper drum assembly
Washer
Shaft
Lower drum assembly

Fig. 2-2-44

2. How to install

(1) Clean the coil parts of the lower drum assembly and the newly installed upper drum assembly with an air brush in advance. (See Fig.2-2-45.)
(2) Install a new washer and upper drum assembly on the drum shaft. (See Fig.2-2-44.)

Note: *When replacing the upper drum assembly, replace it the together with the washer.*

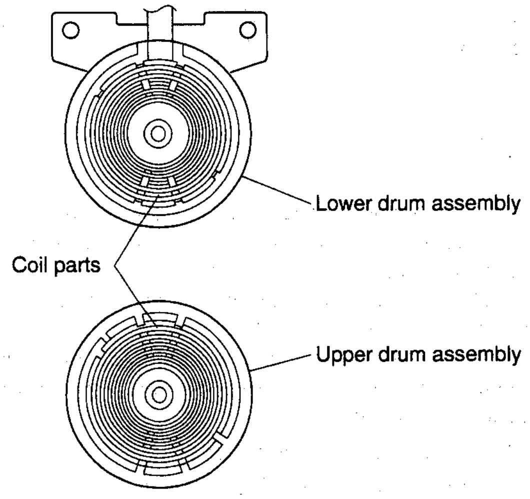

Lower drum assembly
Coil parts
Upper drum assembly

Fig. 2-2-45

(3) Install the cap to the upper drum assembly.
(4) Position the collar assembly as indicated in Fig.2-2-46 while controlling its up- down movement.

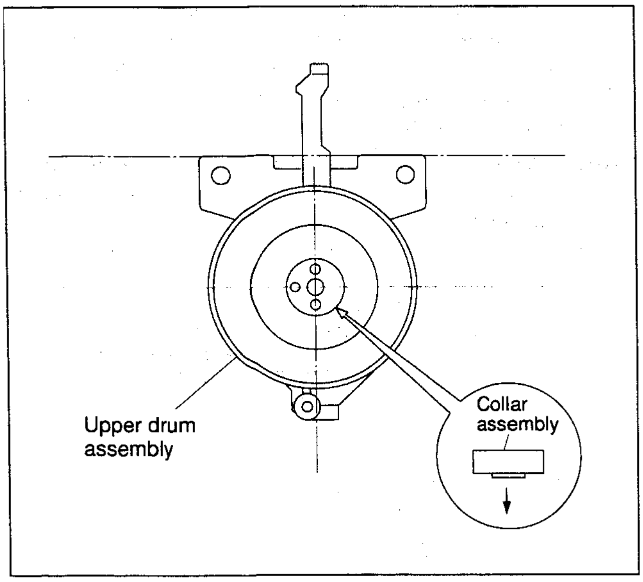


Fig. 2-2-46

(5) Secure the collar assembly in position with a hexagonal wrench while pressing its top with the fingers.

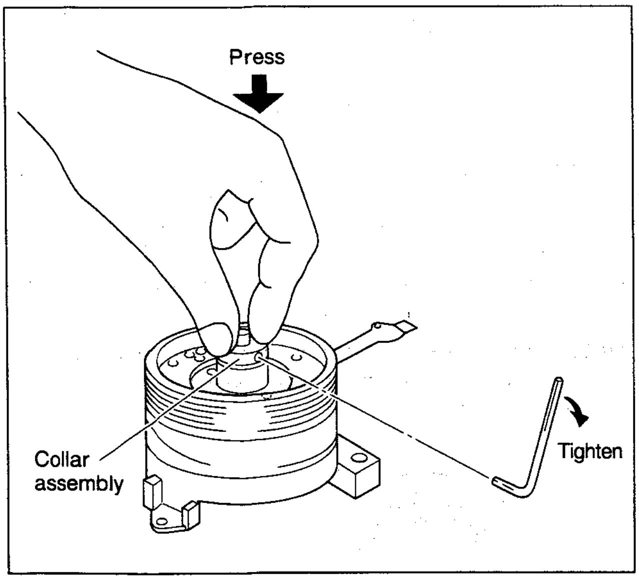


Fig. 2-2-47

(6) After installation, gently turn the upper drum assembly with your hand to make sure that it turns normally. Then install the brush and the spring.
(7) Install the rotor assembly and stator assembly according to Fig 2-2-41 and 2-2-42.
(8) When installation is complete, clean the upper drum assembly and lower drum assembly and carry out the following adjustments.
- PB switching point adjustment
- Slow tracking adjustment
- Compatibility adjustment (Be sure to check for compatibility for the LP mode.)

2.3 COMPATIBILITY ADJUSTMENT

Notes:
- *Although compatibility adjustment is very important, it is not necessary to perform this as part of the normal servicing work. It will be required when you have replaced the audio control head, drum assembly or any part of the tape transport system.*
- *To avoid any damage to the alignment tape while performing the compatibility adjustment, get a separate cassette tape (for recording and play back) ready to be used for checking the initial tape running behavior.*

2.3.1 Checking/Adjustment of FM Waveform Linearity

(1) Connect the oscilloscope to TP106(PB. FM) of the main board assembly and to TP111(D.FF) of the main board assembly for external sync connection.
(2) Playing the alignment tape MHPE, observe the FM waveform.
(3) Press the channel buttons (+, –) simultaneously during playback to enter the manual tracking mode. (This also brings tracking to the centre.)
(4) Make sure that there is no significant level drop of the FM waveform caused by the tracking operation, with its generally parallel and linear variation ensured. Perform the following adjustments when required. (See Fig.2-3-1.)
(5) Reduce the FM waveform while pressing the channel buttons (+, –) during playback. If a drop in level is found on the left side, turn the guide roller of the pole base assembly (supply side) with the roller driver (PTU94002) to make the FM waveform linear.
If a drop in level is on the right side, likewise turn the guide roller of the pole base assembly (take-up side) with the guide roller to make it linear. (See Fig.2-3-3.)
(6) Then play MHPE-L and make sure that the FM waveform varies in parallel and linearly with the tracking operation. When required, perform fine-adjustment of the guide roller of the pole base assembly (supply or take-up side).
(7) Unload the cassette tape once, play the alignment tape MHPE-L again and confirm the FM waveform.

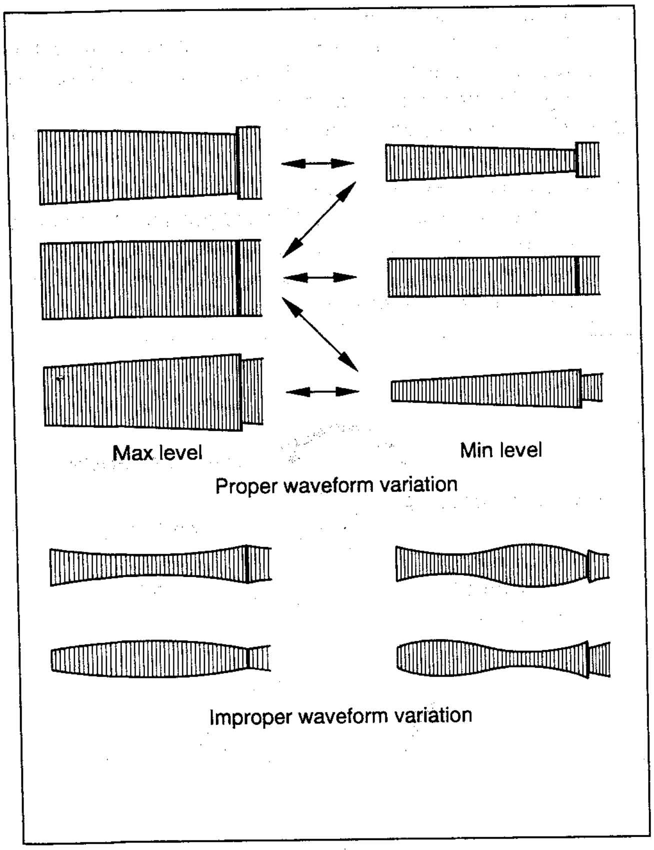

Max level
Min level
Proper waveform variation
Improper waveform variation

Fig. 2-3-1

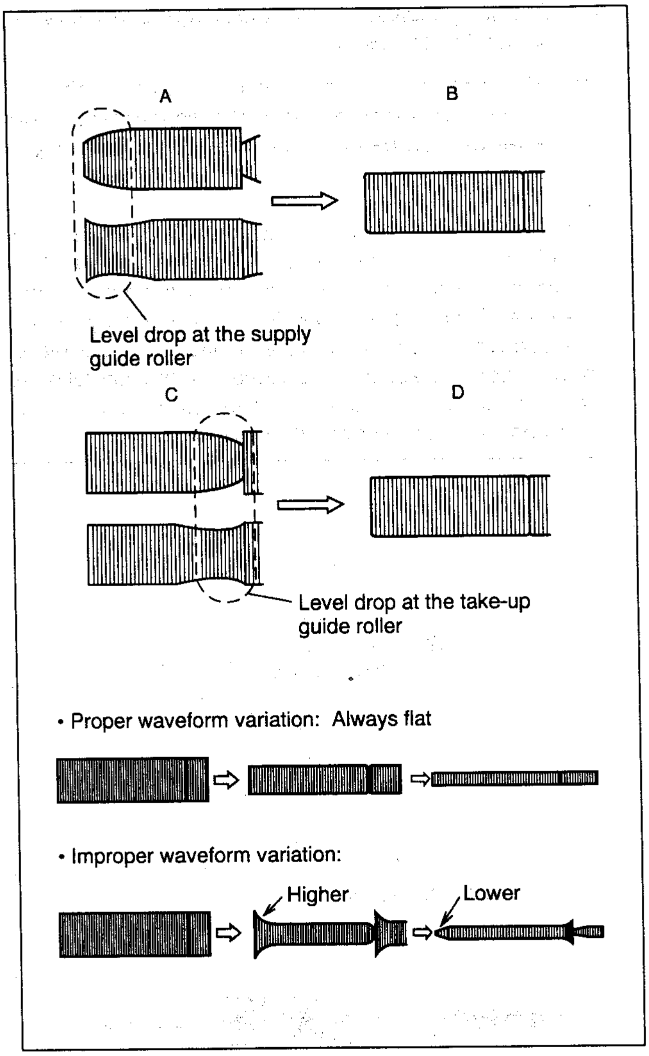

A
B
Level drop at the supply guide roller
C
D
Level drop at the take-up guide roller
• Proper waveform variation: Always flat
• Improper waveform variation:
Higher
Lower

Fig. 2-3-3

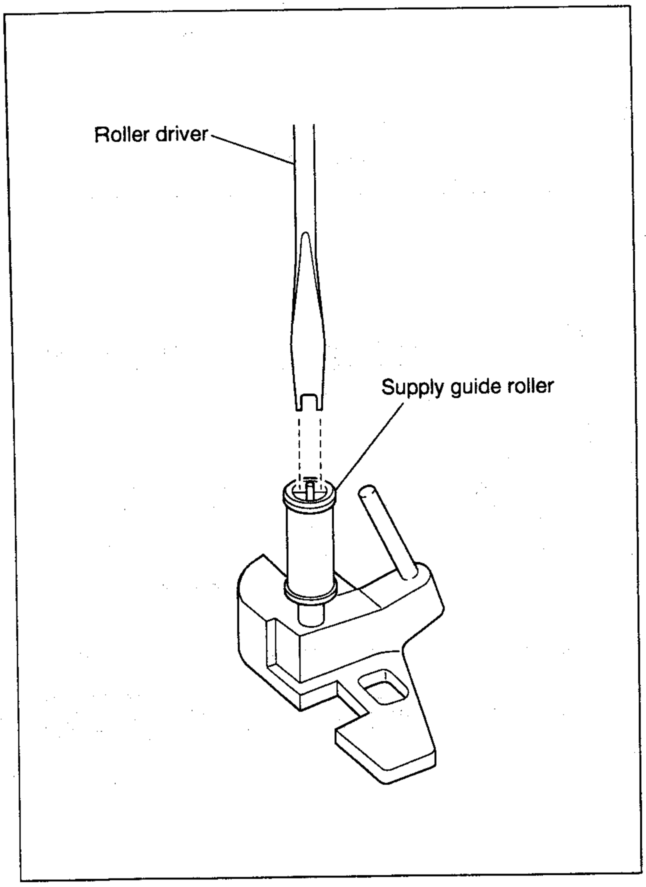

Roller driver
Supply guide roller

Fig. 2-3-2

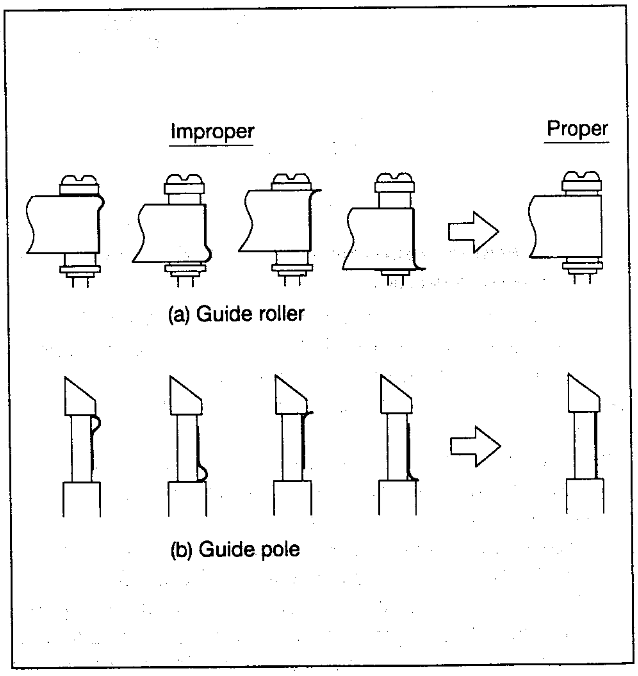

Improper
Proper
(a) Guide roller
(b) Guide pole

Fig. 2-3-4

2.3.2 Checking/Adjustment of the Height and Tilt of the Audio Control Head

Note: *Set a temporary level of the height of the A/C head in advance to make the adjustment easier after the A/C head has been replaced. (See Fig.2-2-15.)*

(1) Connect CH-1 of the oscilloscope to AUDIO OUT and CH-2 to TP4001 (CTL.P) of the main board assembly and observe the waveforms on both channels in the ALT mode.
(2) Play the alignment tape MHPE and adjust it by turning the screws (1), (2) and (3) little by little until the waveform of both the audio output signal and the control pulse reach maximum. The screw (1) and screw (3) are for adjustment of tilt and screw (2) for azimuth.

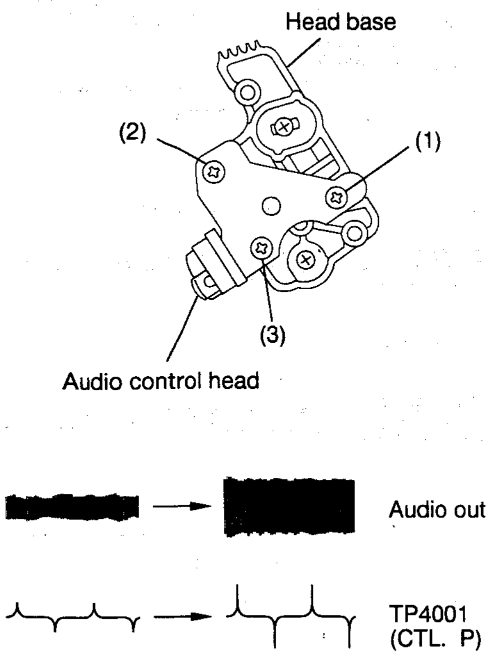


Fig. 2-3-5

2.3.3 Checking/Adjustment of the Audio Control Head Phase (X-Value)

(1) Connect the oscilloscope to TP106(PB. FM) of the main board assembly and to TP111(D.FF) of the main board assembly for external sync connection.
(2) Play the alignment tape MHPE and observe the FM waveforms.
(3) Press the channel buttons (+, –) simultaneously during playback to enter the manual tracking mode. (This also brings tracking to the centre.)
(4) Loosen screws (4) and (5) so that the A/C head position bit (PTU94010) is set as indicated in Fig.2-3-6.
(5) Turn the A/C head position bit fully toward the capstan. Then turn it back gradually toward the drum and stop on the second peak point position of the FM waveform output level. Then tighten the screw (4) temporarily.
(6) Then play the alignment tape MHPE-L.
(7) Press the channel buttons (+, –) simultaneously during playback to enter the manual tracking mode. (This also brings the tracking to the centre.)
(8) Perform the tracking operation and make sure that the FM waveform is at its maximum.
(9) If it is not at maximum, loosen the temporarily tightened the screw (4) and turn the A/C head position bit to bring the audio control head to a position, around where the waveform reaches its maximum for the first time. Then tighten the screws (4) and (5).

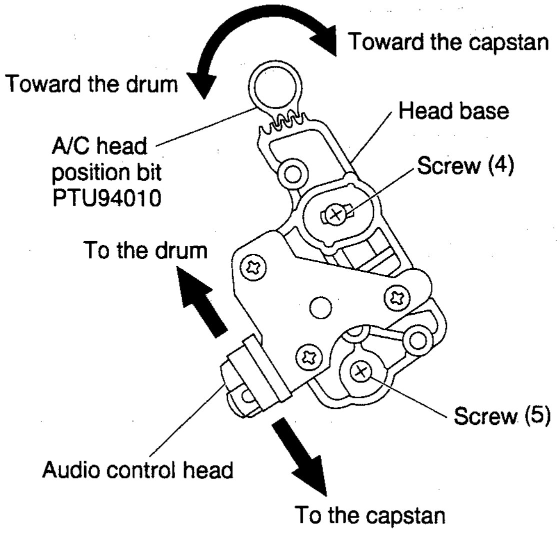


Fig. 2-3-6

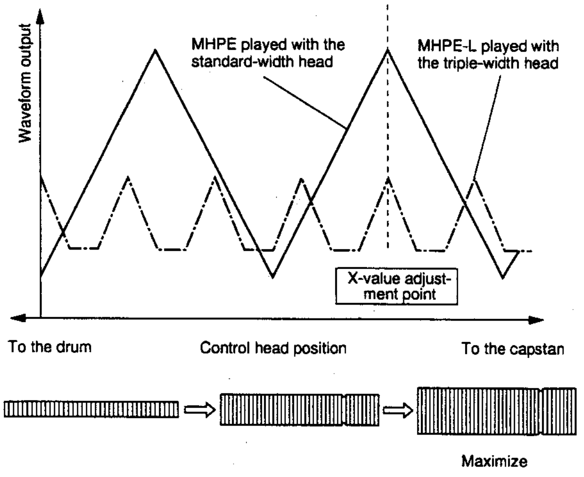


Fig. 2-3-7

2.3.4 Checking/Adjustment the Standard Tracking Preset [HR-J465EK]

Note: *Set the remote control code of the video recorder to A mode.*
(The unit set in B mode does not accept the remote control code of the presetting unit.)

(1) Connect the oscilloscope to TP106(PB FM/COL) of the main board assembly and to TP111(D.FF) of the main board assembly for external sync connection.
(2) Playing the alignment tape MHPE-L and observing the FM waveform, make sure that the auto tracking operation is complete.
(3) Press the button "D" of the presetting unit twice.
(4) Make sure that the MHPE-L is not ejected.
(5) If ejected, again perform the phase (X-value) adjustment of the audio control head.

2.3.5 Checking/Adjustment of the Tension Pole

(1) Check the back tension cassette gauge (PUJ48076-2) to make sure that the indicator points to 25 - 51 gf•cm.
(2) If the indicated value is outside this range, carry out the following adjustment steps.
  1) Select the mechanism servicing mode. (See 1.5 MECHANISM SERVICE MODE.)
  2) While in the Play mode, turn the adjustment pin with a straight-slot screwdriver while taking care not to touch the 2.5 mm dia. pole. (See Fig.2-3-8.)

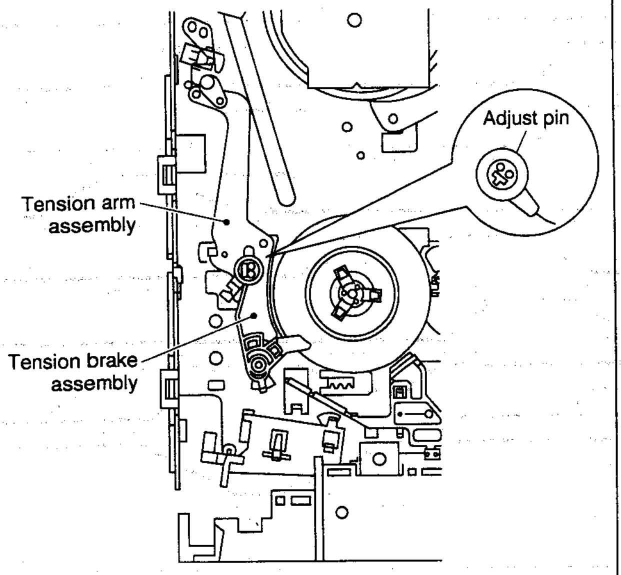


Fig. 2-3-8

2.3.6 Adjustment of the Tension Stud

(1) Adjust so that the left side of the tension stud is on the extension of the notch line of the main deck. (See Fig. 2-3-9.)

Note: *Adjustment is not usually necessary for the tension stud. Perform this adjustment only when it is out of position.*

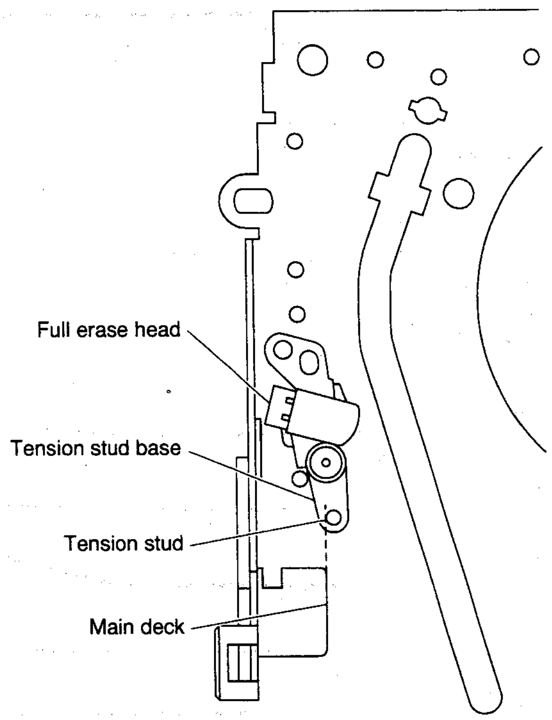


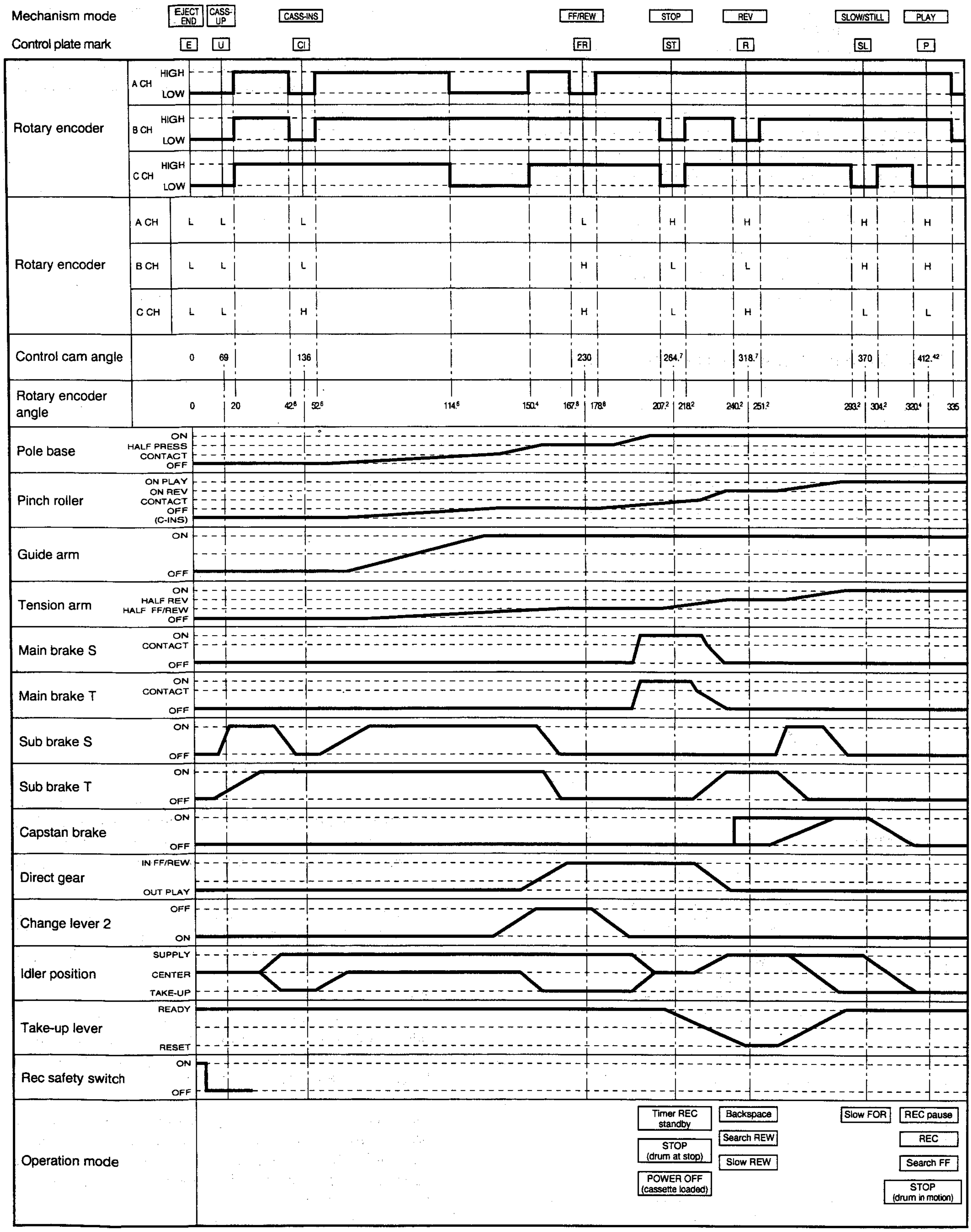
Fig. 2-3-9

2.3.7 Main Brake Torque Adjustment

Note: Adjustment of the main brake torque is required after the adjustment pin has been removed or the main brake assembly or the reel disk on the supply or take-up side have been replaced, removed or attached.

(1) Rotate the pulley of the loading motor by hand to align the mark ▼ on the loading arm gear shaft with the ST marking on the control plate (i.e. set to the STOP mode position).
(2) Insert a torque gauge (PUJ48075-2) into the reel disk on the side to be played, hold the torque gauge lightly, rotate it clockwise when measuring the supply side torque or counterclockwise when measuring the take-up side torque, and read the value indicated at the moment the reel disk starts to slip.
(3) Make sure that the main brake torque values on the supply and take-up sides are both between $23.^5$ — $78.^4$ x 10^{-3} N•m (240 — 800 gf•cm). If the value is outside the specified range, adjust to the specified value by rotating the adjustment pin.
If an adjustment by using the adjustment pin is not possible, replace the main brake assembly.

Mechanism Timing Chart


Mechanism mode
EJECT END
CASS-UP
CASS-INS
FF/REW
STOP
REV
SLOW/STILL
PLAY
Control plate mark
E
U
CI
FR
ST
R
SL
P
Rotary encoder
A CH
B CH
C CH
HIGH
LOW
L
H
Control cam angle
0
69
136
230
264.7
318.7
370
412.42
Rotary encoder angle
0
20
42.6
52.6
114.6
150.4
167.8
178.8
207.2
218.2
240.2
251.2
293.2
304.2
320.4
335
Pole base
ON
HALF PRESS
CONTACT
OFF
Pinch roller
ON PLAY
ON REV
CONTACT
OFF
(C-INS)
Guide arm
ON
OFF
Tension arm
ON
HALF REV
HALF FF/REW
OFF
Main brake S
ON
CONTACT
OFF
Main brake T
ON
CONTACT
OFF
Sub brake S
ON
OFF
Sub brake T
ON
OFF
Capstan brake
ON
OFF
Direct gear
IN FF/REW
OUT PLAY
Change lever 2
OFF
ON
Idler position
SUPPLY
CENTER
TAKE-UP
Take-up lever
READY
RESET
Rec safety switch
ON
OFF
Operation mode
Timer REC standby
STOP (drum at stop)
POWER OFF (cassette loaded)
Backspace
Search REW
Slow REW
Slow FOR
REC pause
REC
Search FF
STOP (drum in motion)

SECTION 3
ELECTRICAL ADJUSTMENT

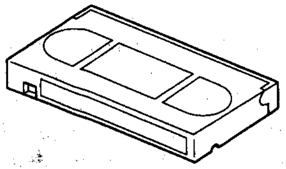
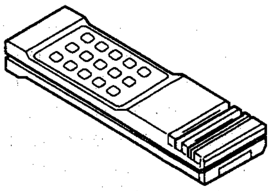
3.1 PRECAUTION

Electrical adjustment are required after replacing circuit components and certain mechanical parts. It is important to perform these adjustments only after all repairs and replacements have been completed. Also do not attempt these adjustments unless the proper equipments is available.

3.1.1 Required test equipment

① Colour television or monitor
② Oscilloscope: wide-band,dual-trace,triggered delayed sweep
③ Frequency counter
④ Digital voltmeter
⑤ Signal generator: RF/IF sweep/marker
⑥ Signal generator: PAL colour bar, stairstep
⑦ Recording tape
⑧ Digit-key remote controller(provided)

3.1.2 Required adjustment tools

Alignment tape (SP,stairstep) MHPE	Presetting unit PTU94008
	

3.1.3 Colour bar signal,colour bar pattern

- PAL colour bar signal

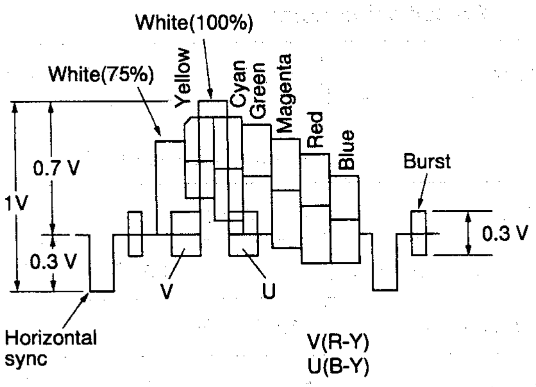

White(100%)
White(75%)
Yellow
Cyan
Green
Magenta
Red
Blue
Burst
0.7 V
1V
0.3 V
0.3 V
V
U
Horizontal sync
V(R-Y)
U(B-Y)

Fig.3-1-1 PAL colour bar signal waveform

- PAL colour bar pattern

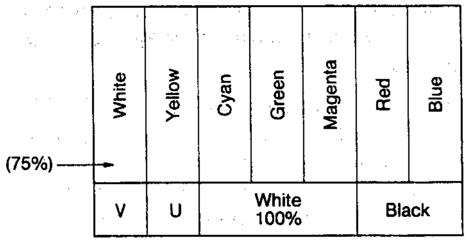

White
Yellow
Cyan
Green
Magenta
Red
Blue
(75%)
V
U
White 100%
Black

Fig.3-1-2 PAL colour bar pattern

Note:

*The system control circuit of this model has an automatic recognition about the ON-OFF control of the **DOCTOR SYSTEM.***

3.2 SERVO CIRCUIT

Notes: • ***Unless otherwise specified,all measurement point and adjustment parts are located on the MAIN BOARD.***

• ***Set the VCR to the mode A by the remote controller.***

3.2.1 PB switching point

Signal	• Alignment tape [MHPE],Stairstep
Mode	• PB • Automatic tracking OFF
Equipment	• Oscilloscope
Measurement point	• J7101-pin 19 (VIDEO OUT)
Trigger slope (-)	• TP111(D. FF)
Adjustment tool	• Presetting unit [PTU94008]
Specification	• 6.5 ± 0.5H

Note: • ***Use only the "O" button, depressing other buttons during adjustment may cause adjustment errors.***

(1) Connect an oscilloscope to J7101-pin 19 (VIDEO OUT) and external trigger from TP111 (negative slope).
(2) Playback the stairstep signal of the alignment tape.
(3) Press the "O" button of the presetting unit.
The adjustment is performed automatically. Once the adjustment is performed, the VCR will go into the STOP mode.
(4) Playback the alignment tape again, confirm the switching point (See Fig.3-2-2).

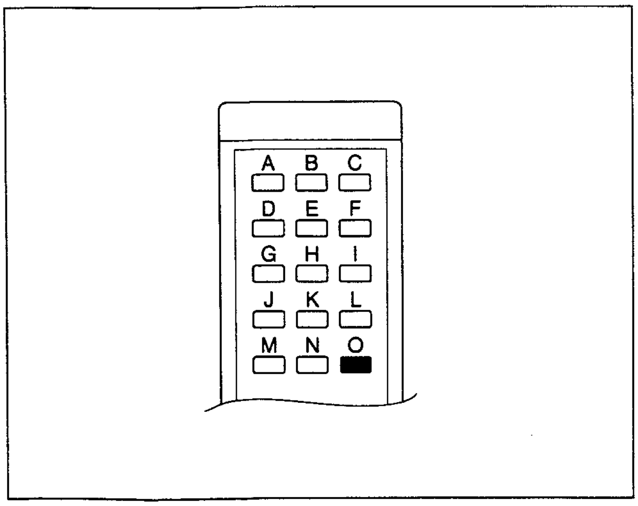


Fig.3-2-1 Presetting unit

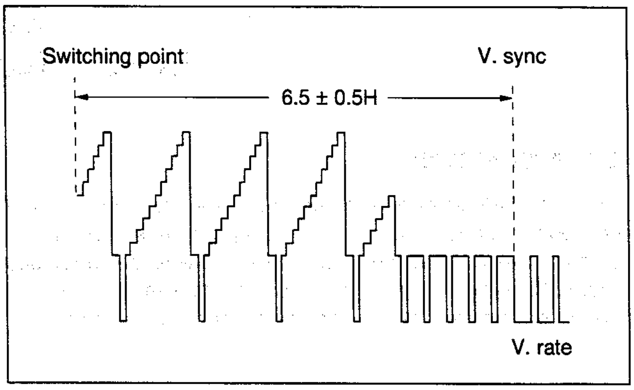


Fig.3-2-2 PB switching point

3.2.2 Slow tracking preset [HR-J465EK]

Signal	• Tuner or colour bar
Mode	• SP/LP, REC → PB(SLOW) • Automatic tracking OFF
Equipment	• TV-Monitor
Adjustment tool	• Presetting unit [PTU94008]
Specification	• Minimum noise

Note: • ***Use only the "B" and "C" buttons, depressing other buttons during adjustment may cause adjustment errors.***

(1) Record a colour bar signal in the SP mode.
(2) Playback the recorded signal on the FWD slow mode.
(3) Set the tracking control to the centre position by simultaneously pressing the CH "+" and "−" buttons.
(4) Observe the display on the TV monitor and adjust for optimum noise condition (best tracking) by depressing the "B " or "C " buttons of the presetting unit.
(5) Depress the STOP button.
(6) Confirm that the bar noise is not visible on the TV monitor in the slow mode.
(7) Repeat steps (2) to (6) in the REV slow mode.
(8) Repeat steps (1) to (7) in the LP mode.

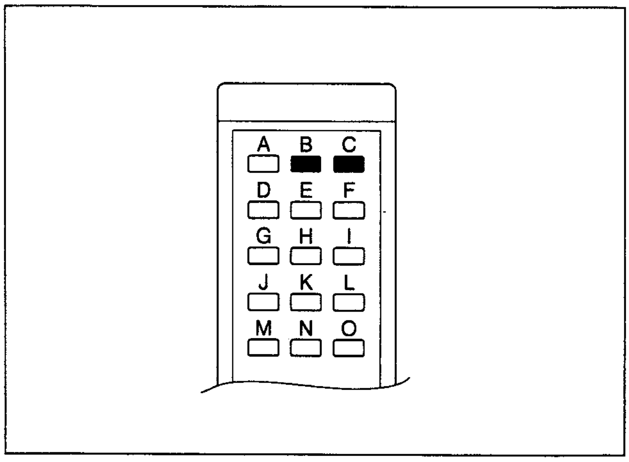


Fig.3-2-3 Presetting unit

3.2.3 Slow tracking preset [HR-J260EK/J265EK]

Signal	• Tuner or colour bar
Mode	• LP, REC → PB(SLOW) • Automatic tracking OFF
Equipment	• TV-Monitor
Adjustment tool	• Presetting unit [PTU94008]
Specification	• Minimum noise

Note: • ***Use only the "B" and "C" buttons, depressing other buttons during adjustment may cause adjustment errors.***

(1) Record a colour bar signal in the LP mode.
(2) Playback the recorded signal on the FWD slow mode.
(3) Set the tracking control to the centre position by simultaneously pressing the CH "+" and "–" buttons.
(4) Observe the display on the TV monitor and adjust for optimum noise condition (best tracking) by depressing the "B " or "C " buttons of the presetting unit.
(5) Depress the STOP button.
(6) Confirm that the bar noise is not visible on the TV monitor in the slow mode.
(7) Repeat steps (2) to (6) in the REV slow mode.

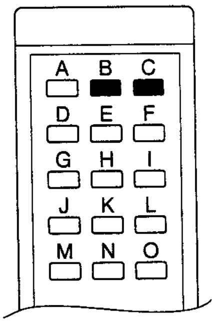


Fig.3-2-4 Presetting unit

3.3 VIDEO CIRCUIT

Note: • ***Set the VCR to the mode A by the remote controller.***

3.3.1 Auto picture

Signal	• Monoscope
Mode	• B.E.S.T : OFF • REC then PB • SP/LP
Adjustment tool	• Presetting unit [PTU94008]
Specification	• STOP mode

Note: • ***Use only the "L" button, depressing other buttons during adjustment may cause adjustment errors.***

(1) Record a monoscope signal in the SP mode.
(2) Playback the recorded signal.
(3) Press the "L" button of the presetting unit during playback.
(4) Confirm that the VCR will go into the STOP mode.
(5) Repeat steps (2) to (4) in the LP mode.

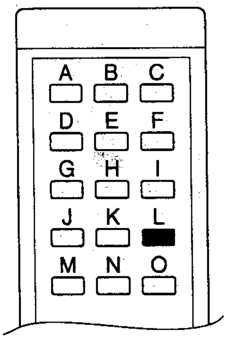


Fig.3-3-1 Presetting unit

3.4 ON SCREEN CIRCUIT

Note: • ***Set the VCR to the mode A by the remote controller.***

3.4.1 Character position

Signal	• No signal
Mode	• EE
Equipment	• TV-monitor
Adjustment tool	• Presetting unit [PTU94008] • Digit-key remote controller
Specification	• Character centre

Note: • ***Use only the "H" button, depressing other buttons during adjustment may cause adjustment errors.***

(1) Press the MENU button and display the on screen character.

(2) Observe the TV-monitor and centre position of character by pressing the "H" button of the presetting unit.

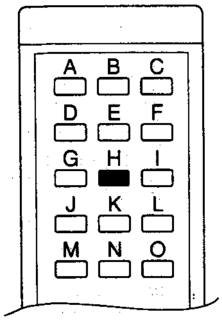


Fig.3-4-1 Presetting unit

SECTION 4
CHARTS AND DIAGRAMS

NOTES OF SCHEMATIC DIAGRAM

Safety precautions
The Components identified by the symbol ⚠ are critical for safety. For continued safety, replace safety critical components only with manufacturer's recommended parts.

1. Units of components on the schematic diagram

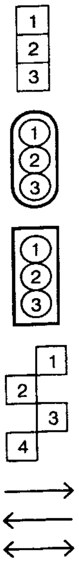
Unless otherwise specified.

1) All resistance values are in ohm, 1/6 W, 1/8 W (refer to parts list).
   Chip resistors are 1/16 W.
   K: KΩ (1000Ω), M: MΩ (1000KΩ)
2) All capacitance values are in µF, (P: PF).
3) All inductance values are in µH, (m: mH).
4) All diodes are 1SS133, MA165 or 1N4148M (refer to parts list).

2. Indications of control voltage

AUX : Active at high
$\overline{\text{AUX}}$ or AUX(L) : Active at low

3. Interpreting Connector indications


1
2
3
1
2
3
1
2
3
1
2
3
4

Removable connector

Wire soldered directly on board

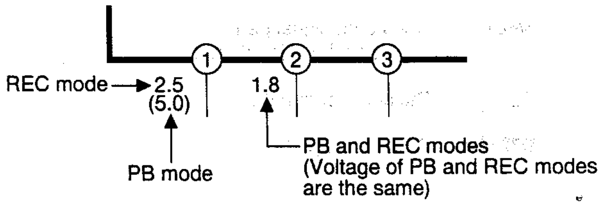
Non-removable Board connector

Board to Board

Connected pattern on board
The arrows indicate signal path

4. Voltage measurement

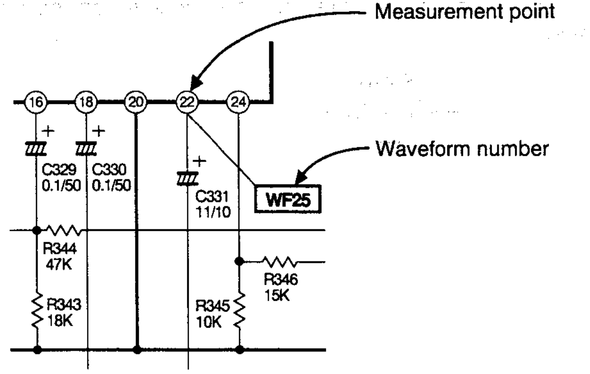
1) Video circuits
   REC : Colour bar signal in SP mode, normal VHS mode
   PB : Alignment tape, colour bar SP mode, normal VHS mode
   — : Unmeasurable or unnecessary to measure
2) Audio circuits
   REC : 1KHz, –8 dBs sine wave signal in SP mode, Normal VHS mode
   PB : REC then playback it
3) Movie Camera circuits
   Measured using a correctly illuminated gray scale or colour bar test charts in the E-E mode
4) Indication on schematic diagram
   Voltage Indications for REC and PB mode on the schematic diagram are as shown below.


①
②
③
REC mode
2.5
(5.0)
1.8
PB mode
PB and REC modes
(Voltage of PB and REC modes are the same)

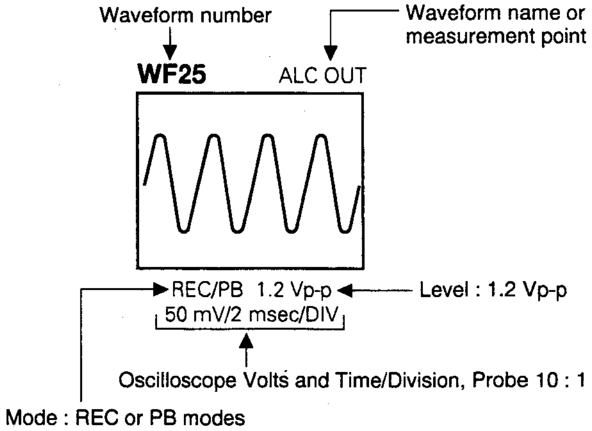
Note: If the voltages are not indicated on the schematic diagram, refer to the voltage charts.

5. Waveform measurement

1) Video circuits
   REC : Colour bar signal in SP mode, normal VHS mode
   PB : Alignment tape, colour bar SP mode, normal VHS mode
2) Audio circuits
   REC : 1KHz, –8 dBs sine wave signal in SP mode, normal VHS mode
   PB : REC then playback it
3) Movie Camera circuits
   Measured using a correctly illuminated gray scale or colour bar test chatrs in the E-E mode
4) Indication on schematic diagram
   Waveform indications on the schematic diagram are as shown below.


Measurement point
Waveform number
⑯
⑱
⑳
㉒
㉔
C329
0.1/50
C330
0.1/50
C331
11/10
WF25
R344
47K
R343
18K
R345
10K
R346
15K

5) Waveform indications


Waveform number
Waveform name or measurement point
WF25
ALC OUT
REC/PB 1.2 Vp-p
Level : 1.2 Vp-p
50 mV/2 msec/DIV
Oscilloscope Volts and Time/Division, Probe 10 : 1
Mode : REC or PB modes

6. Signal path Symbols

The arrows indicate the signal path as follows.

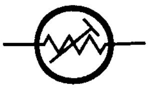
⇨	Playback signal path
➩	Playback and recording signal path
➡	Recording signal path (including E-E signal path)
⇨▷	Capstan servo path
➡▶	Drum servo path

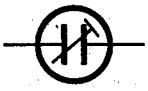
(Example)

⇨ R-Y	Playback R-Y signal path
➡ Y	Recording Y signal path

7. Indication of the parts for adjustments

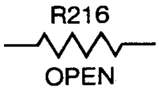
The parts for the adjustments are surrounded with the circle as shown below.





8. Indication of the parts not mounted on the circuit board

"OPEN" is indicated by the parts not mounted on the circuit board.



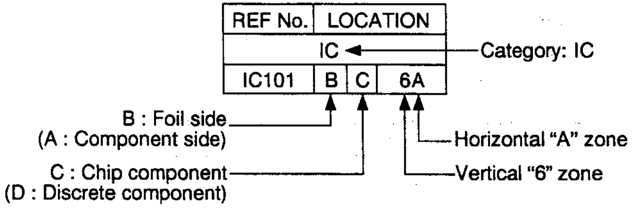
CIRCUIT BOARD NOTES

1. Foil and Component sides

1) Foil side (B side) :
   Parts on the foil side seen from foil face (pattern face) are indicated.
2) Component side (A side) :
   Parts on the component side seen from component face (parts face) indicated.

2. Parts location guides

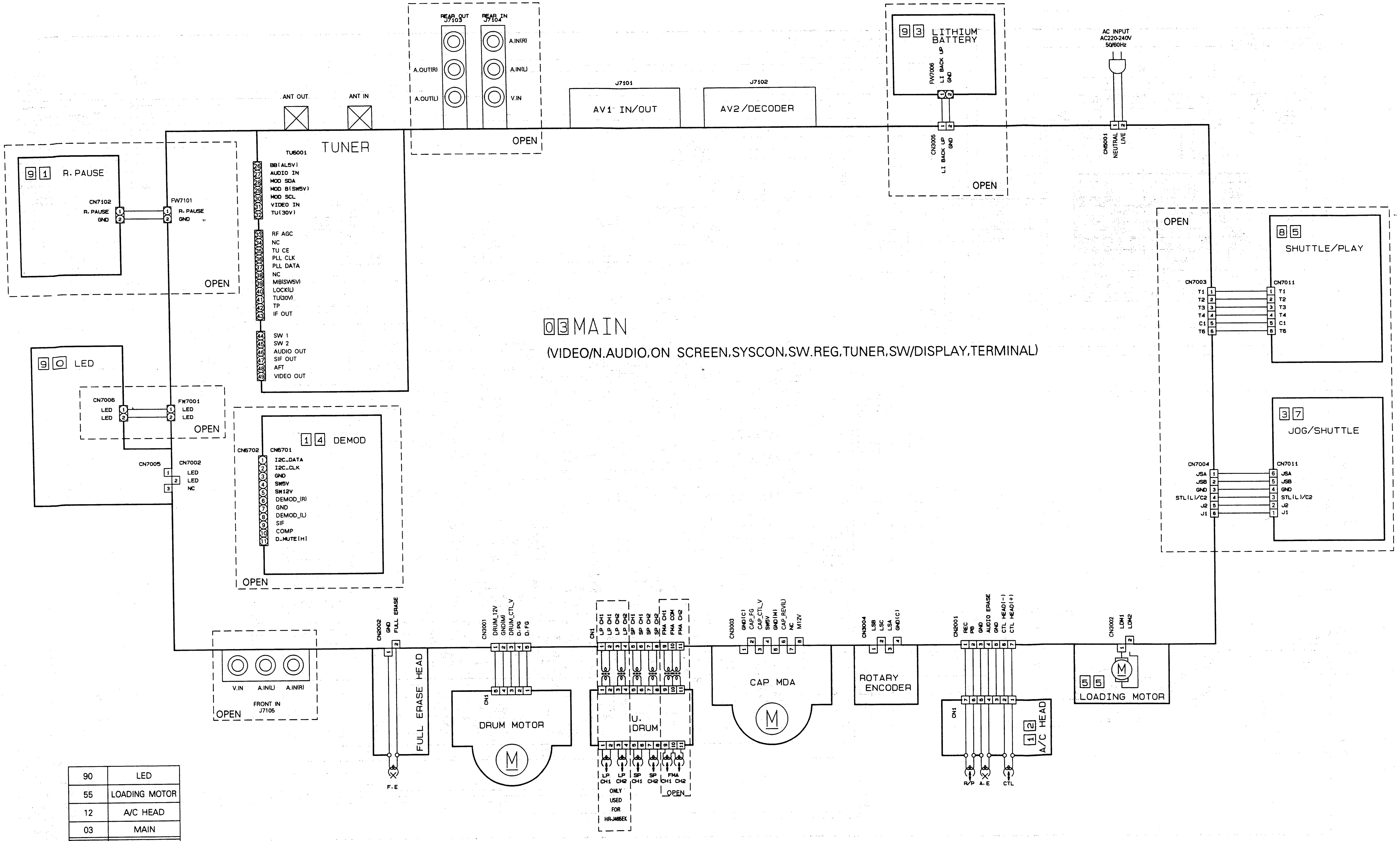
Parts location are indicated by guide scale on the circuit board.


REF No.
LOCATION
IC
Category: IC
IC101
B
C
6A
B : Foil side
(A : Component side)
C : Chip component
(D : Discrete component)
Horizontal "A" zone
Vertical "6" zone

Note:

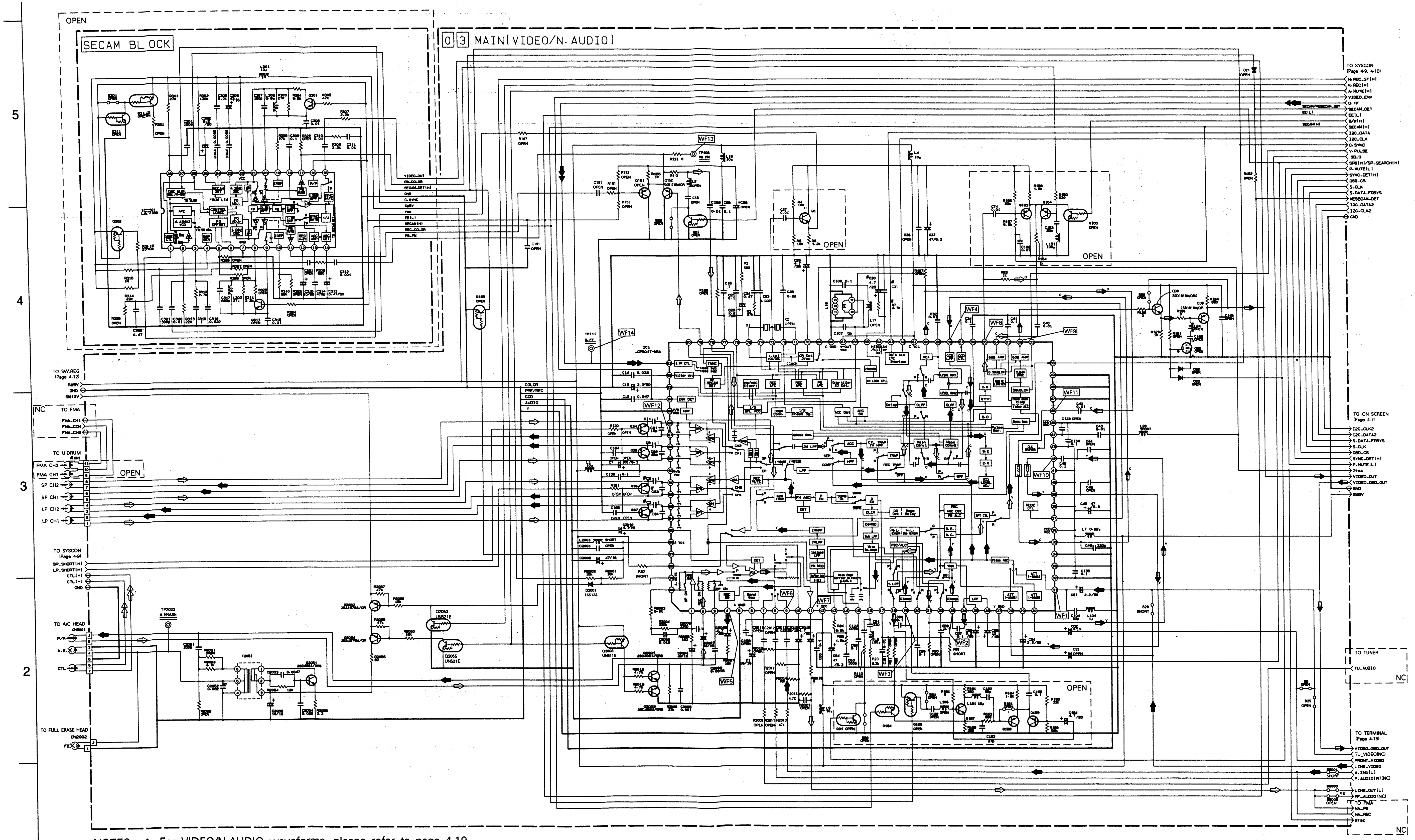
For general information in service manual, please refer to the Service Manual of GENERAL INFORMATION Edition 4 No. 82054D (January 1994).

4.1 BOARD INTERCONNECTIONS


REAR OUT J7103
REAR IN J7104
A.OUT(R)
A.OUT(L)
A.IN(R)
A.IN(L)
V.IN
OPEN
ANT OUT
ANT IN
J7101
AV1 IN/OUT
J7102
AV2/DECODER
93 LITHIUM BATTERY
FW7006
LI BACK UP
GND
CN3005
LI BACK UP
GND
OPEN
AC INPUT
AC220-240V
50/60Hz
CN5001
NEUTRAL
LIVE
TUNER
TU6001
26 BB(AL5V)
27 AUDIO IN
28 MOD SDA
29 MOD B(SW5V)
30 MOD SCL
31 VIDEO IN
32 TU(30V)
33 RF AGC
34 NC
35 TU CE
36 PLL CLK
37 PLL DATA
38 NC
39 MB(SW5V)
40 LOCK(L)
41 TU(30V)
42 TP
43 IF OUT
44 SW 1
45 SW 2
46 AUDIO OUT
47 SIF OUT
48 AFT
49 VIDEO OUT
91 R. PAUSE
CN7102
R. PAUSE
GND
FW7101
R. PAUSE
GND
OPEN
90 LED
CN7006
LED
LED
FW7001
LED
LED
OPEN
CN7005
CN7002
LED
LED
NC
14 DEMOD
CN6702
CN6701
1 I2C_DATA
2 I2C_CLK
3 GND
4 SW5V
5 SW12V
6 DEMOD_(R)
7 GND
8 DEMOD_(L)
9 SIF
10 COMP
11 D_MUTE(H)
OPEN
03 MAIN
(VIDEO/N.AUDIO,ON SCREEN,SYSCON,SW.REG,TUNER,SW/DISPLAY,TERMINAL)
OPEN
85 SHUTTLE/PLAY
CN7003
T1
T2
T3
T4
C1
T6
CN7011
T1
T2
T3
T4
C1
T6
37 JOG/SHUTTLE
CN7004
JSA
JSB
GND
STL(L)/C2
J2
J1
CN7011
JSA
JSB
GND
STL(L)/C2
J2
J1
V.IN
A.IN(L)
A.IN(R)
FRONT IN
J7105
OPEN
CN2002
GND
FULL ERASE
FULL ERASE HEAD
F.E
CN3001
DRUM_12V
GND(M)
DRUM_CTL_V
D. PG
D. FG
CN1
DRUM MOTOR
M
CN1
LP CH1
LP CH1
LP CH2
LP CH2
SP CH1
SP CH1
SP CH2
SP CH2
FMA CH1
FMA COM
FMA CH2
U. DRUM
LP CH1
LP CH2
SP CH1
SP CH2
FMA CH1 CH2
ONLY USED FOR HR-J465EK
OPEN
CN3003
GND(C)
CAP_FG
CAP_CTL_V
SW5V
GND(M)
CAP_REV(L)
NC
M12V
CAP MDA
M
CN3004
LSB
LSC
LSA
GND(C)
ROTARY ENCODER
CN2001
REC
PB
GND
AUDIO ERASE
GND
CTL HEAD(-)
CTL HEAD(+)
CN1
12 A/C HEAD
R/P
A.E
CTL
CN3002
LDM1
LDM2
M
55 LOADING MOTOR

90	LED
55	LOADING MOTOR
12	A/C HEAD
03	MAIN
NO	NAME

4.2 VIDEO/N.AUDIO SCHEMATIC DIAGRAM


OPEN
SECAM BLOCK
03 MAIN[VIDEO/N.AUDIO]
TO SYSCON
(Page 4-9, 4-10)
N.REC_ST(H)
N.REC(H)
A.MUTE(H)
VIDEO_ENV
D.FF
SECAM_DET
EE(L)
B/W(H)
SECAM(H)
I2C_DATA
I2C_CLK
C.SYNC
V.PULSE
SB_G
SPB(H)/SP_SEARCH(H)
P.MUTE(L)
SYNC_DET(H)
OSD_CS
S_CLK
S.DATA_FRSYS
MESECAM_DET
I2C_DATA2
I2C_CLK2
GND
TO SW.REG
(Page 4-12)
SW5V
GND
SW12V
NC
TO FMA
FMA_CH1
FMA_COM
FMA_CH2
TO U.DRUM
#CN1
FMA CH2
FMA CH1
SP CH2
SP CH1
LP CH2
LP CH1
TO SYSCON
(Page 4-9)
SP_SHORT(H)
LP_SHORT(H)
CTL(+)
CTL(-)
GND
TO A/C HEAD
CN2001
P/R
A.E.
CTL
TO FULL ERASE HEAD
CN2002
FE
TP2033
A.ERASE
IC1
TP111
WF1
WF2
WF3
WF4
WF5
WF6
WF7
WF8
WF9
WF10
WF11
WF12
WF13
WF14
TO ON SCREEN
(Page 4-7)
I2C_CLK2
I2C_DATA2
S.DATA_FRSYS
S_CLK
OSD_CS
SYNC_DET(H)
P.MUTE(L)
2fsc
VIDEO_OUT
VIDEO_OSD_OUT
GND
SW5V
TO TUNER
TU_AUDIO
NC
TO TERMINAL
(Page 4-15)
VIDEO_OSD_OUT
TU_VIDEO(NC)
FRONT_VIDEO
LINE_VIDEO
A.IN1(L)
F.AUDIO(R)(NC)
LINE_OUT(L)
RF_AUDIO(NC)
TO FMA
NA_PB
NA_REC
2fsc
NC
5
4
3
2

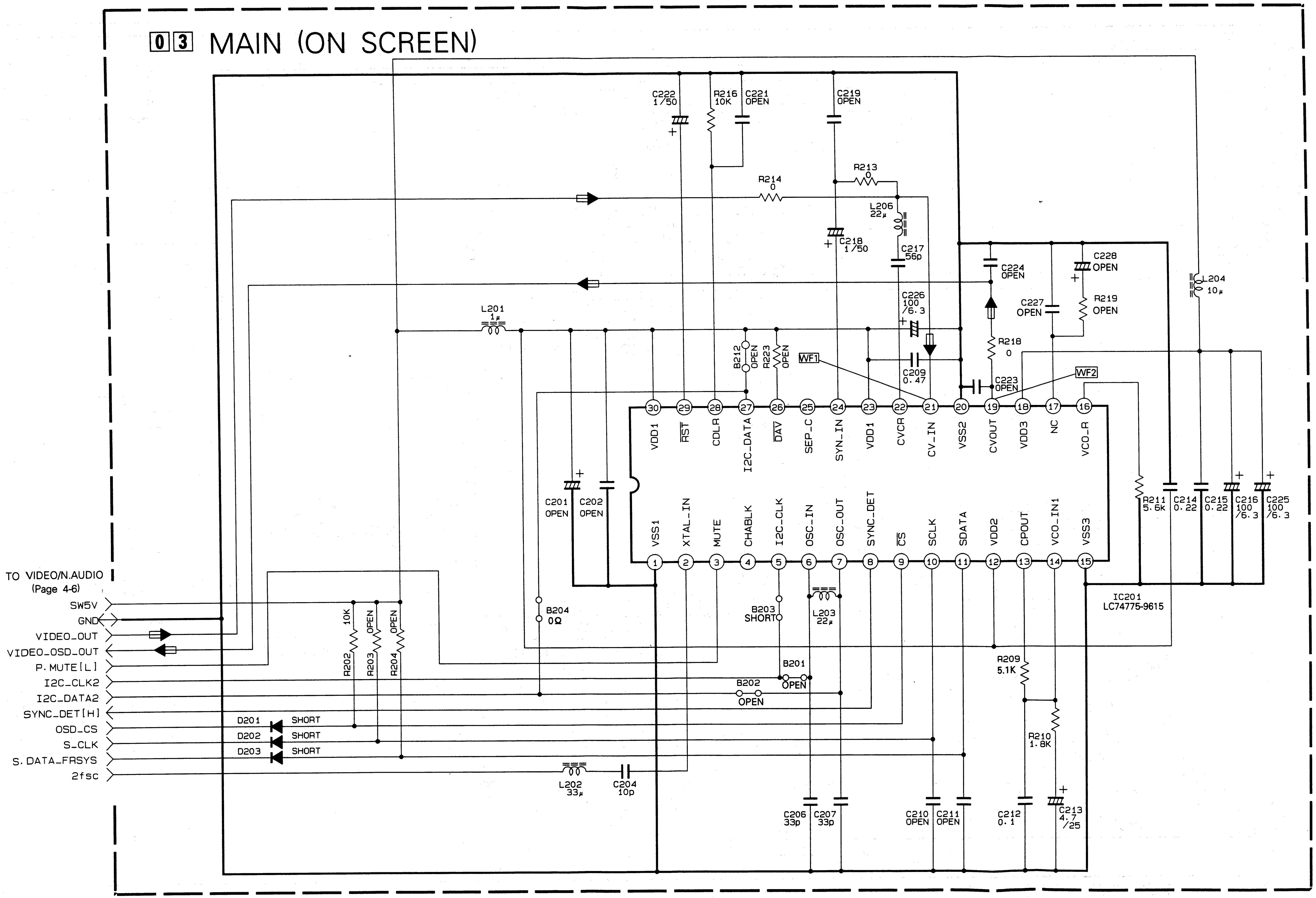
NOTES : 1. For VIDEO/N.AUDIO waveforms, please refer to page 4-19.

2. COMPARISON CHART OF MODELS & MARKS(#).

	REF.NO.	CN1	R7	C3,C5,C30	C31	C83,C84
MODEL	HR-J260EK HR-J265EK	5-8 (1-4:NOT USED)	NOT USED	NOT USED	0Ω	0Ω
	HR-J465EK	1-8	USED	USED	0.022μF	15p

1

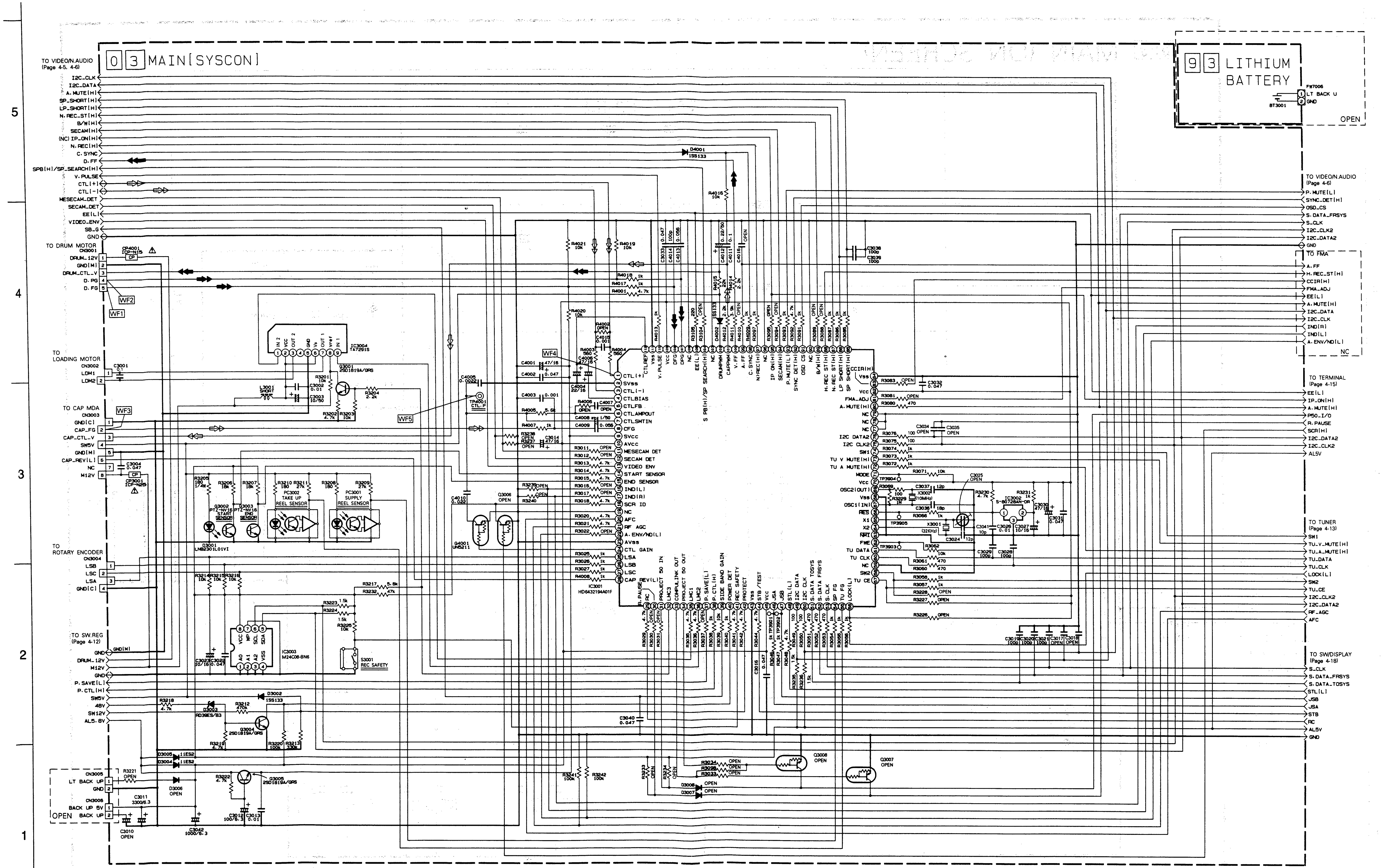
4.3 ON SCREEN SCHEMATIC DIAGRAM



03 MAIN (ON SCREEN)
C222 1/50
R216 10K
C221 OPEN
C219 OPEN
R213 0
R214 0
L206 22μ
C218 1/50
C217 56p
C226 100 /6.3
C224 OPEN
C228 OPEN
C227 OPEN
R219 OPEN
L204 10μ
R218 0
L201 1μ
B212 OPEN
R223 OPEN
WF1
WF2
C209 0.47
C223 OPEN
VDD1
RST
CDLR
I2C_DATA
DAV
SEP_C
SYN_IN
VDD1
CVCR
CV_IN
VSS2
CVOUT
VDD3
NC
VCO_R
VSS1
XTAL_IN
MUTE
CHABLK
I2C_CLK
OSC_IN
OSC_OUT
SYNC_DET
CS
SCLK
SDATA
VDD2
CPOUT
VCO_IN1
VSS3
C201 OPEN
C202 OPEN
R211 5.6K
C214 0.22
C215 0.22
C216 100 /6.3
C225 100 /6.3
IC201 LC74775-9615
TO VIDEO/N.AUDIO (Page 4-6)
SW5V
GND
VIDEO_OUT
VIDEO_OSD_OUT
P. MUTE [L]
I2C_CLK2
I2C_DATA2
SYNC_DET [H]
OSD_CS
S_CLK
S. DATA_FRSYS
2fsc
R202 10K
R203 OPEN
R204 OPEN
B204 0Ω
B203 SHORT
L203 22μ
B201 OPEN
B202 OPEN
R209 5.1K
R210 1.8K
D201 SHORT
D202 SHORT
D203 SHORT
L202 33μ
C204 10p
C206 33p
C207 33p
C210 OPEN
C211 OPEN
C212 0.1
C213 4.7 /25
A
B
C
D
E
F
G
H
1
2
3
4
5

NOTE: For ON SCREEN waveforms, please refer to page 4-19.

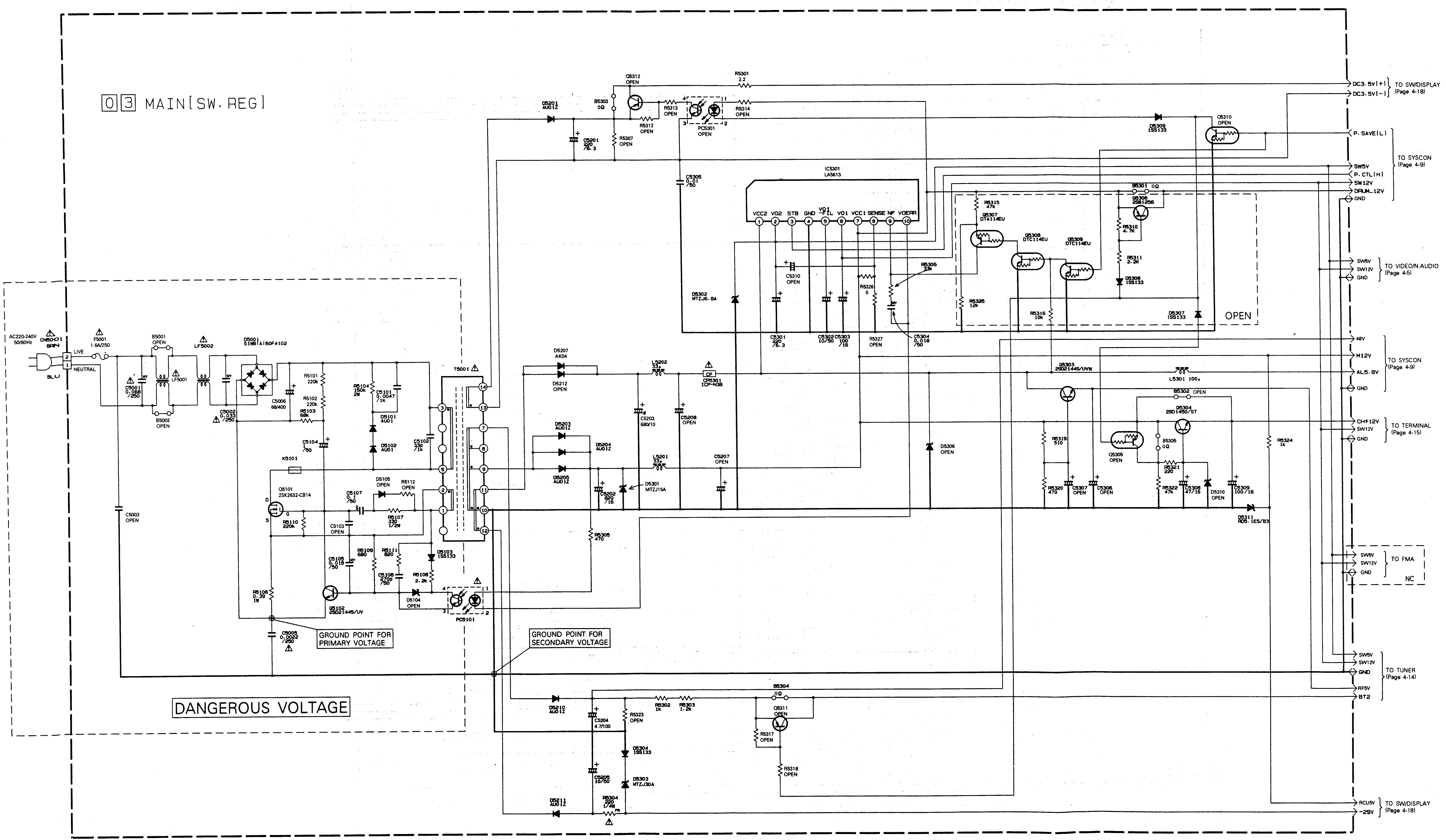
4.4 SYSTEM CONTROL SCHEMATIC DIAGRAM



03 MAIN[SYSCON]
93 LITHIUM BATTERY
TO VIDEO/N.AUDIO (Page 4-5, 4-6)
I2C_CLK
I2C_DATA
A. MUTE[H]
SP_SHORT[H]
LP_SHORT[H]
N. REC_ST[H]
B/W[H]
SECAM[H]
(NC) IP_ON[H]
N. REC[H]
C. SYNC
D. FF
SPB[H]/SP_SEARCH[H]
V. PULSE
CTL[+]
CTL[-]
MESECAM_DET
SECAM_DET
EE[L]
VIDEO_ENV
SB_G
GND
TO DRUM MOTOR
CN3001
DRUM_12V
GND[M]
DRUM_CTL_V
D. PG
D. FG
WF1
WF2
WF3
WF4
WF5
TO LOADING MOTOR
CN3002
LDM1
LDM2
TO CAP MDA
CN3003
GND[C]
CAP_FG
CAP_CTL_V
SW5V
GND[M]
CAP_REV[L]
NC
M12V
TO ROTARY ENCODER
CN3004
LSB
LSC
LSA
GND[C]
TO SW.REG (Page 4-12)
GND
DRUM_12V
M12V
GND
P. SAVE[L]
P. CTL[H]
SW5V
48V
SW12V
AL5.8V
CN3005
LT BACK UP
GND
CN3006
BACK UP 5V
BACK UP
OPEN
IC3004 TA7291S
Q3001 2SD1819A/QRS
Q3002 PTZ-NV16 START SENSOR
Q3003 PTZ-NV16 END SENSOR
PC3002 TAKE UP REEL SENSOR
PC3001 SUPPLY REEL SENSOR
D3001 LN8230IL01VI
IC3003 M24C08-BN6
S3001 REC SAFETY
Q3004 2SD1819A/QRS
Q3005 2SD1819A/QRS
D3002 1SS133
D3003 RD39ES/B3
D3004 11ES2
D3005 11ES2
D3006 OPEN
C3011 3300/6.3
C3042 1000/6.3
C3010 OPEN
Q4001 UN5211
Q3006 OPEN
TP4001 CTL. P
D4001 1SS133
IC3001 HD6432194A01F
CTL[+]
SVss
CTL[-]
CTLBIAS
CTLFB
CTLAMPOUT
CTLSMTIN
CFG
SVcc
AVcc
MESECAM DET
SECAM DET
VIDEO ENV
START SENSOR
END SENSOR
IND[L]
IND[R]
SCR ID
NC
AFC
RF AGC
A. ENV/ND[L]
AVss
CTL GAIN
LSA
LSB
LSC
CAP REV[L]
CCIR[H]
Vss
Vcc
FMA_ADJ
A. MUTE[H]
I2C DATA2
I2C CLK2
SW1
TU V MUTE[H]
TU A MUTE[H]
MODE
OSC2[OUT]
OSC1[IN]
RES
X1
X2
FWE
TU DATA
TU CLK
SW2
TU CE
X3002 (10MHz)
X3001 (32KHz)
IC3002 S-80728AN-DR
Q3008 OPEN
Q3007 OPEN
FW7006
LT BACK U
GND
BT3001
OPEN
TO VIDEO/N.AUDIO (Page 4-6)
P. MUTE[L]
SYNC_DET[H]
OSD_CS
S. DATA_FRSYS
S_CLK
I2C_CLK2
I2C_DATA2
GND
TO FMA
A. FF
H. REC_ST[H]
CCIR[H]
FMA_ADJ
EE[L]
A. MUTE[H]
I2C_DATA
I2C_CLK
IND[R]
IND[L]
A. ENV/ND[L]
NC
TO TERMINAL (Page 4-15)
EE[L]
IP_ON[H]
A. MUTE[H]
P50_I/O
R. PAUSE
SCR[H]
I2C_DATA2
I2C_CLK2
AL5V
TO TUNER (Page 4-13)
SW1
TU_V_MUTE[H]
TU_A_MUTE[H]
TU_DATA
TU_CLK
LOCK[L]
SW2
TU_CE
I2C_CLK2
I2C_DATA2
RF_AGC
AFC
TO SW/DISPLAY (Page 4-18)
S_CLK
S. DATA_FRSYS
S. DATA_TOSYS
STL[L]
JSB
JSA
STB
RC
AL5V
GND
1
2
3
4
5
A
B
C
D
E
F
G
H

NOTES. : 1. For SYSCON waveforms, please refer to page 4-19.
2. The SYSTEM CONTROL circuit of this model has an automatic recognition about the ON-OFF control of the DOCTOR SYSTEM.

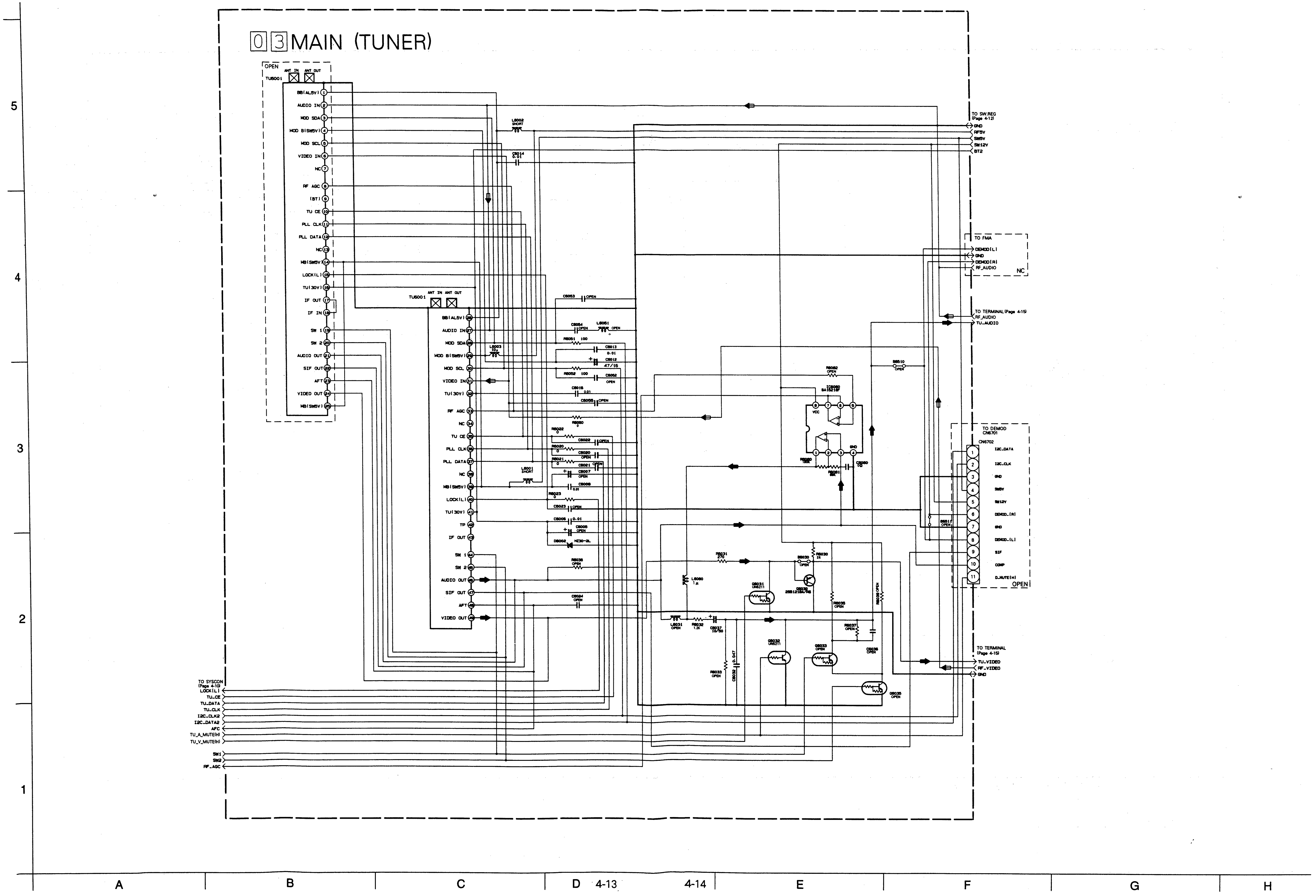
4.5 SWITCHING REGULATOR SCHEMATIC DIAGRAM


5
4
3
2
1
03 MAIN[SW. REG]
AC220-240V 50/60Hz
CN5001
BRN
BLU
LIVE
NEUTRAL
F5001 1.6A/250
B5001 OPEN
B5002 OPEN
C5001 0.068 /250
LF5001
LF5002
C5002 0.033 /250
D5001 S1WB(A)60F4102
C5006 68/400
R5101 220k
R5102 220k
R5103 68k
R5104 150k 2W
C5101 0.0047 /1k
D5101 AU01
D5102 AU01
C5102 330 /1k
C5104 1 /50
K5101
Q5101 2SK2632-CB14
D
G
S
R5110 220k
C5107 0.1 /50
D5105 OPEN
R5112 OPEN
R5107 330 1/2W
C5103 OPEN
C5105 0.018 /50
R5109 680
R5111 820
C5108 270p /50
D5103 1SS133
R5108 2.2k
D5104 OPEN
R5106 0.39 1W
Q5102 2SD2144S/UV
PC5101
C5003 OPEN
C5005 0.0022 /250
GROUND POINT FOR PRIMARY VOLTAGE
DANGEROUS VOLTAGE
T5001
D5201 AU01Z
C5201 220 /6.3
B5303 0Ω
Q5312 OPEN
R5312 OPEN
R5307 OPEN
R5313 OPEN
PC5301 OPEN
R5301 2.2
R5314 OPEN
C5305 0.01 /50
IC5301 LA5613
VCC2
VO2
STB
GND
VO1 -FIL
VO1
VCC1
SENSE
NF
VOERR
C5310 OPEN
R5326 0
R5306 33k
D5302 MTZJ6.8A
C5301 220 /6.3
C5302 10/50
C5303 100 /16
R5327 OPEN
C5304 0.018 /50
D5207 AK04
D5212 OPEN
L5202 33μ
CP5301 ICP-N38
C5203 680/10
C5208 OPEN
D5203 AU01Z
D5204 AU01Z
D5205 AU01Z
L5201 33μ
C5207 OPEN
C5202 820 /16
D5301 MTZJ15A
R5305 470
D5306 OPEN
GROUND POINT FOR SECONDARY VOLTAGE
D5309 1SS133
Q5310 OPEN
B5301 0Ω
Q5306 2SB1256
R5315 47k
Q5307 DTA114EU
Q5308 DTC114EU
Q5309 DTC114EU
R5310 4.7K
R5311 2.2K
D5308 1SS133
R5325 12k
R5316 10k
D5307 1SS133
OPEN
Q5303 2SD2144S/UVW
L5301 100μ
B5302 OPEN
Q5304 2SD1450/ST
R5319 510
Q5305 OPEN
B5305 0Ω
R5321 220
R5320 470
C5307 OPEN
C5306 OPEN
R5322 47k
C5308 47/16
D5310 OPEN
C5309 100/16
D5311 RD5.1ES/B3
R5324 1k
D5210 AU01Z
C5204 4.7/100
R5323 OPEN
D5304 1SS133
C5205 10/50
D5303 MTZJ30A
D5211 AU01Z
R5304 220 1/4W
FR
R5302 1k
R5303 1.2k
B5304 0Ω
Q5311 OPEN
R5317 OPEN
R5318 OPEN
DC3.5V(+)
DC3.5V(-)
TO SW/DISPLAY (Page 4-18)
P.SAVE(L)
SW5V
P.CTL(H)
SW12V
DRUM_12V
GND
TO SYSCON (Page 4-9)
SW5V
SW12V
GND
TO VIDEO/N.AUDIO (Page 4-5)
48V
M12V
AL5.8V
GND
TO SYSCON (Page 4-9)
CH+12V
SW12V
GND
TO TERMINAL (Page 4-15)
SW5V
SW12V
GND
TO FMA
NC
SW5V
SW12V
GND
RF5V
BT2
TO TUNER (Page 4-14)
RCU5V
-29V
TO SW/DISPLAY (Page 4-18)

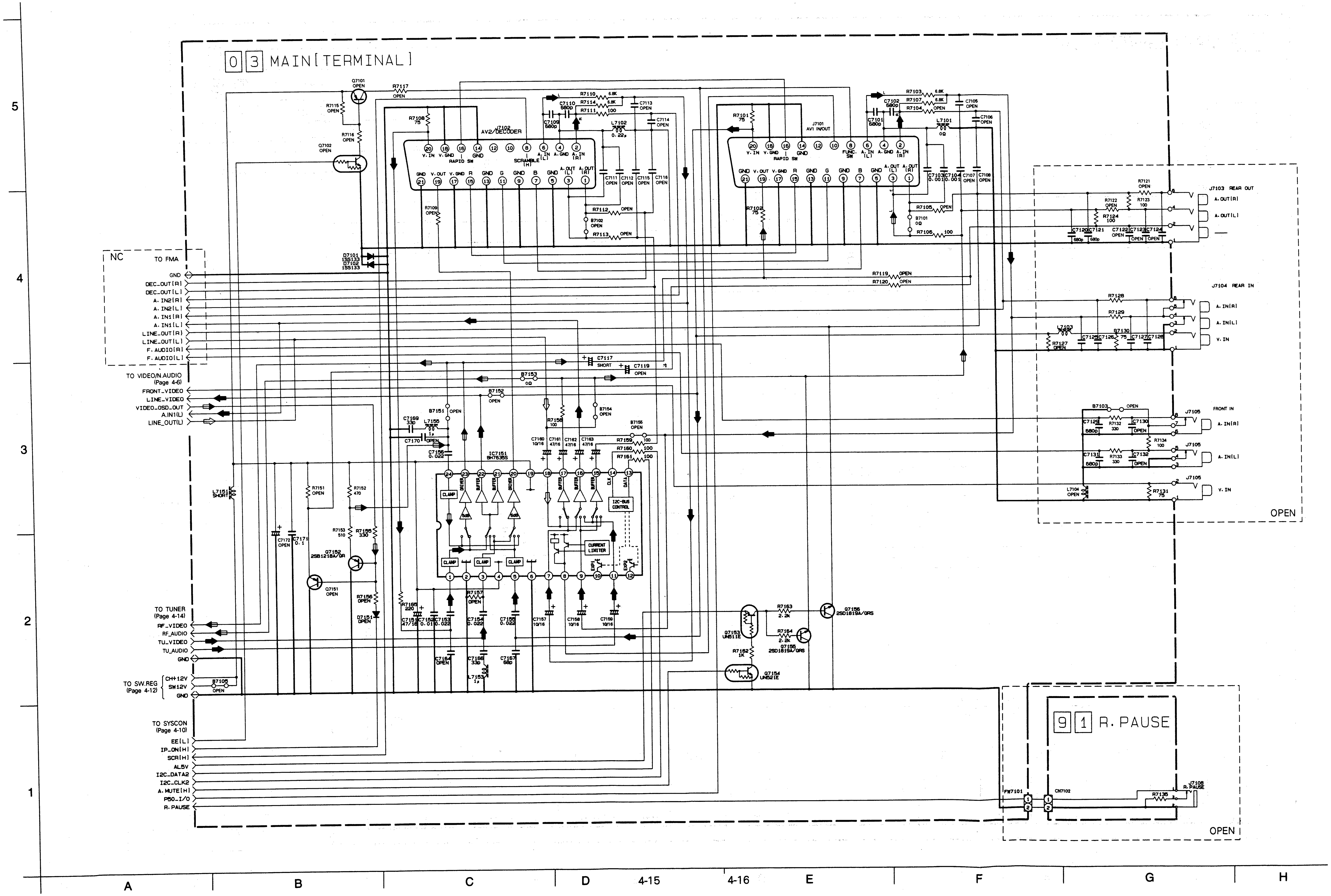
NOTE: COMPARISON CHART OF MODELS & MARK(#).

	REF.NO.	C5203
MODEL	HR-J260EK HR-J265EK	NOT USED
	HR-J465EK	USED

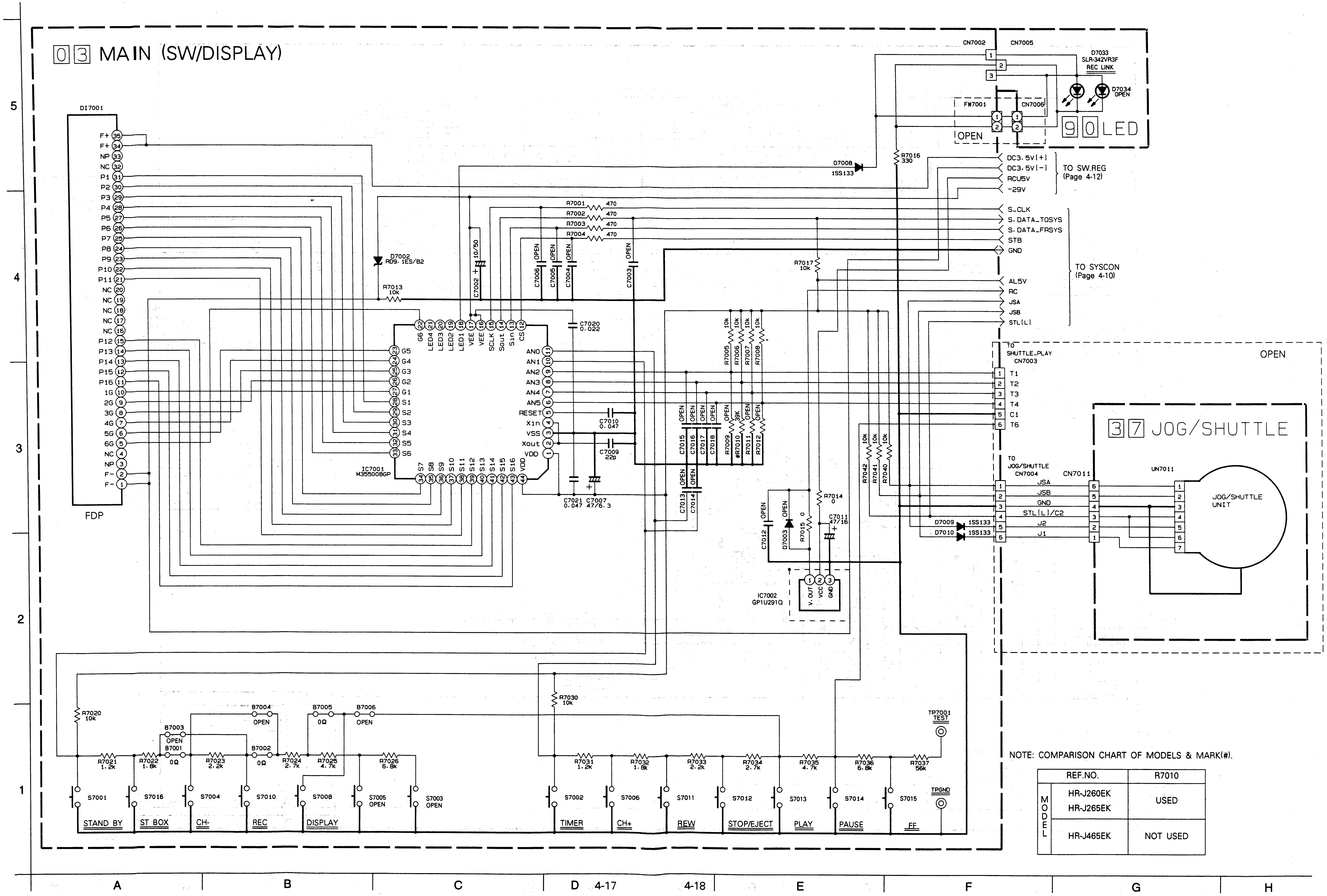
4.6 TUNER SCHEMATIC DIAGRAM


03 MAIN (TUNER)
OPEN
TU6001
ANT IN
ANT OUT
BB(AL5V) 1
AUDIO IN 2
MOD SDA 3
MOD B(SW5V) 4
MOD SCL 5
VIDEO IN 6
NC 7
RF AGC 8
(BT) 9
TU CE 10
PLL CLK 11
PLL DATA 12
NC 13
MB(SW5V) 14
LOCK(L) 15
TU(30V) 16
IF OUT 17
IF IN 18
SW 1 19
SW 2 20
AUDIO OUT 21
SIF OUT 22
AFT 23
VIDEO OUT 24
MB(SW5V) 25
BB(AL5V) 26
AUDIO IN 27
MOD SDA 28
MOD B(SW5V) 29
MOD SCL 30
VIDEO IN 31
TU(30V) 32
RF AGC 33
NC 34
TU CE 35
PLL CLK 36
PLL DATA 37
NC 38
MB(SW5V) 39
LOCK(L) 40
TU(30V) 41
TP 42
IF OUT 43
SW 1 44
SW 2 45
AUDIO OUT 46
SIF OUT 47
AFT 48
VIDEO OUT 49
L6002 SHORT
C6014 0.01
L6003 10μ
L6001 SHORT
C6053 OPEN
C6054 OPEN
L6051 OPEN
R6051 100
C6013 0.01
C6012 47/16
R6052 100
C6052 OPEN
C6015 0.01
C6055 OPEN
R6050 0
R6022 0
C6022 OPEN
R6020 0
C6020 OPEN
R6021 0
C6021 OPEN
C6007 OPEN
C6008 0.01
R6023 0
C6023 OPEN
C6006 0.01
C6005 OPEN
D6002 HZ30-2L
R6036 OPEN
C6024 OPEN
R6062 OPEN
IC6060 BA15218F
VCC
GND
R6060 150K
R6061 68K
C6060 0Ω
B6510 OPEN
R6031 270
B6030 OPEN
R6030 1k
Q6030 2SB1218A/RS
L6060 1μ
Q6031 UN5211
R6035 OPEN
R6039 OPEN
L6031 OPEN
R6032 1.2K
C6037 10/50
R6037 OPEN
Q6032 UN5211
Q6033 OPEN
C6036 OPEN
R6033 OPEN
C6032 0.047
Q6035 OPEN
TO SW.REG (Page 4-12)
GND
RF5V
SW5V
SW12V
BT2
TO FMA
DEMOD(L)
GND
DEMOD(R)
RF_AUDIO
NC
TO TERMINAL (Page 4-15)
RF_AUDIO
TU_AUDIO
TO DEMOD CN6701
CN6702
1 I2C_DATA
2 I2C_CLK
3 GND
4 SW5V
5 SW12V
6 DEMOD_(R)
7 GND
8 DEMOD_(L)
9 SIF
10 COMP
11 D_MUTE(H)
B6511 OPEN
OPEN
TO TERMINAL (Page 4-15)
TU_VIDEO
RF_VIDEO
GND
TO SYSCON (Page 4-10)
LOCK(L)
TU_CE
TU_DATA
TU_CLK
I2C_CLK2
I2C_DATA2
AFC
TU_A_MUTE(H)
TU_V_MUTE(H)
SW1
SW2
RF_AGC
5
4
3
2
1
A
B
C
D
E
F
G
H

4.7 TERMINAL SCHEMATIC DIAGRAM


03 MAIN[TERMINAL]
91 R.PAUSE
NC
TO FMA
GND
DEC_OUT[R]
DEC_OUT[L]
A.IN2[R]
A.IN2[L]
A.IN1[R]
A.IN1[L]
LINE_OUT[R]
LINE_OUT[L]
F.AUDIO[R]
F.AUDIO[L]
TO VIDEO/N.AUDIO (Page 4-6)
FRONT_VIDEO
LINE_VIDEO
VIDEO_OSD_OUT
A.IN1(L)
LINE_OUT(L)
TO TUNER (Page 4-14)
RF_VIDEO
RF_AUDIO
TU_VIDEO
TU_AUDIO
GND
TO SW.REG (Page 4-12)
CH+12V
SW12V
GND
TO SYSCON (Page 4-10)
EE[L]
IP_ON[H]
SCR[H]
AL5V
I2C_DATA2
I2C_CLK2
A.MUTE[H]
P50_I/O
R.PAUSE
J7102 AV2/DECODER
J7101 AV1 IN/OUT
IC7151 BH7635S
J7103 REAR OUT
J7104 REAR IN
J7105 FRONT IN
J7106 R.PAUSE
A.OUT[R]
A.OUT[L]
A.IN[R]
A.IN[L]
V.IN
CLAMP
DRIVER
BUFFER
CLK
DATA
I2C-BUS CONTROL
CURRENT LIMITER
Q7101 OPEN
Q7102 OPEN
Q7151
Q7152 2SB1218A/QR
Q7153 UN511E
Q7154 UN521E
Q7155 2SD1819A/QRS
Q7156 2SD1819A/QRS
D7101 1SS133
D7102 1SS133
D7151 OPEN
FW7101
CN7102
OPEN
1
2
3
4
5
A
B
C
D
E
F
G
H

4.8 SW/DISPLAY AND LED SCHEMATIC DIAGRAMS



03 MAIN (SW/DISPLAY)
90 LED
37 JOG/SHUTTLE
DI7001
FDP
F+ F+ NP NC P1 P2 P3 P4 P5 P6 P7 P8 P9 P10 P11 NC NC NC NC NC P12 P13 P14 P15 P16 1G 2G 3G 4G 5G 6G NC NP F- F-
IC7001
M35500BGP
G6 LED4 LED3 LED2 LED1 VEE VEE SCLK Sout Sin CS
G5 G4 G3 G2 G1 S1 S2 S3 S4 S5 S6
S7 S8 S9 S10 S11 S12 S13 S14 S15 S16 VDD
AN0 AN1 AN2 AN3 AN4 AN5 RESET Xin VSS Xout VDD
D7002 RD9.1ES/B2
R7013 10k
C7002 10/50
R7001 470
R7002 470
R7003 470
R7004 470
C7006 OPEN
C7005 OPEN
C7004 OPEN
C7003 OPEN
C7020 0.022
C7010 0.047
C7009 22p
C7021 0.047
C7007 47/6.3
D7008 1SS133
R7016 330
R7017 10k
R7005 10k
R7006 10k
R7007 10k
R7008 10k
C7015 OPEN
C7016 OPEN
C7017 OPEN
C7018 OPEN
R7009 OPEN
#R7010 39K
R7011 OPEN
R7012 OPEN
C7013 OPEN
C7014 OPEN
C7012 OPEN
D7003 OPEN
R7015 0
R7014 0
C7011 47/16
IC7002
GP1U291Q
V.OUT VCC GND
R7042 10k
R7041 10k
R7040 10k
D7009 1SS133
D7010 1SS133
CN7002
CN7005
D7033
SLR-342VR3F
REC LINK
D7034 OPEN
FW7001
CN7006
OPEN
DC3.5V(+)
DC3.5V(-)
RCU5V
-29V
TO SW.REG
(Page 4-12)
S_CLK
S.DATA_TOSYS
S.DATA_FRSYS
STB
GND
AL5V
RC
JSA
JSB
STL(L)
TO SYSCON
(Page 4-10)
TO SHUTTLE_PLAY CN7003
T1 T2 T3 T4 C1 T6
OPEN
TO JOG/SHUTTLE CN7004
CN7011
JSA JSB GND STL(L)/C2 J2 J1
UN7011
JOG/SHUTTLE UNIT
R7020 10k
R7021 1.2k
R7022 1.8k
B7003 OPEN
B7001 0Ω
R7023 2.2k
B7004 OPEN
B7002 0Ω
R7024 2.7k
B7005 0Ω
R7025 4.7k
B7006 OPEN
R7026 6.8k
R7030 10k
R7031 1.2k
R7032 1.8k
R7033 2.2k
R7034 2.7k
R7035 4.7k
R7036 6.8k
R7037 56k
TP7001 TEST
TPGND
S7001 STAND BY
S7016 ST BOX
S7004 CH-
S7010 REC
S7008 DISPLAY
S7005 OPEN
S7003 OPEN
S7002 TIMER
S7006 CH+
S7011 REW
S7012 STOP/EJECT
S7013 PLAY
S7014 PAUSE
S7015 FF
A B C D E F G H
1 2 3 4 5

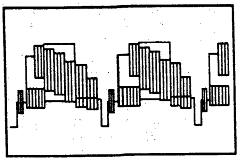
NOTE: COMPARISON CHART OF MODELS & MARK(#).

	REF.NO.	R7010
MODEL	HR-J260EK HR-J265EK	USED
	HR-J465EK	NOT USED

WAVEFORMS

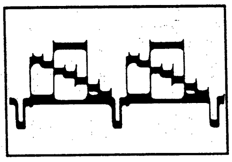
— VIDEO/N.AUDIO —

WF1 IC1-31



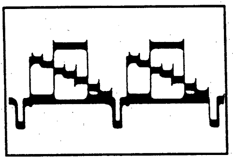
REC 0.88 Vp-p
50 mV/20 µsec/DIV

WF2-1 IC1-23



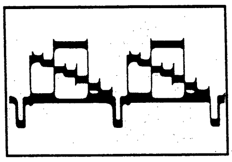
REC 0.47 Vp-p
20 mV/20 µsec/DIV

WF2-2 IC1-23



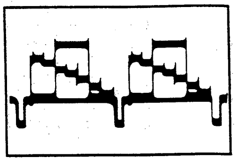
PB 0.53 Vp-p
20 mV/20 µsec/DIV

WF3-1 IC1-19



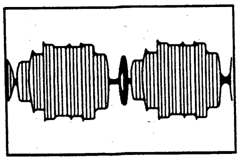
REC 0.5 Vp-p
20 mV/20 µsec/DIV

WF3-2 IC1-19



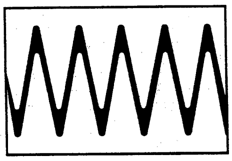
PB 0.55 Vp-p
20 mV/20 µsec/DIV

WF4 IC1-58



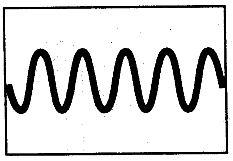
REC/PB 0.5 Vp-p
20 mV/20 µsec/DIV

WF5 IC1-4



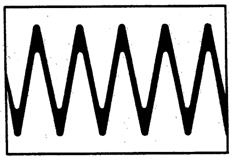
REC 1.2 Vp-p
20 mV/0.5 msec/DIV

WF6 IC1-9



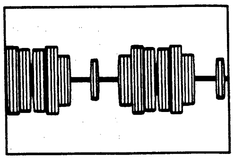
REC 0.17 Vp-p
5 mV/0.5 msec/DIV

WF7 IC1-11



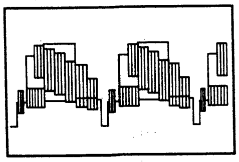
PB 1.0 Vp-p
10 mV/0.5 msec/DIV

WF8 IC1-55



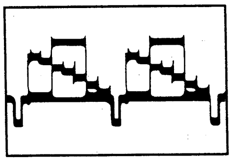
PB 0.6 Vp-p
20 mV/20 µsec/DIV

WF9 IC1-52



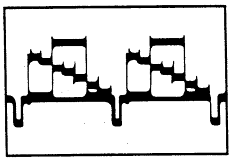
REC/PB 2.2 Vp-p
0.1 V/20 µsec/DIV

WF10-1 IC1-42



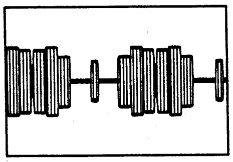
REC 0.4 Vp-p
10 mV/20 µsec/DIV

WF10-2 IC1-42



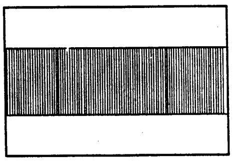
PB 0.48 Vp-p
10 mV/20 µsec/DIV

WF11 IC1-46



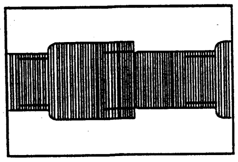
REC/PB 0.34 Vp-p
10 mV/20 µsec/DIV

WF12 IC1-87



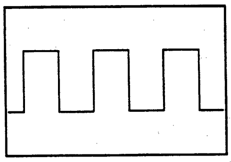
REC 1.6 Vp-p
50 mV/1 msec/DIV

WF13 TP106
PB FM



PB 0.5 Vp-p
20 mV/1 msec/DIV

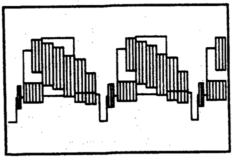
WF14 TP111
D.FF



REC/PB 5.1 Vp-p
0.2 V/10 msec/DIV

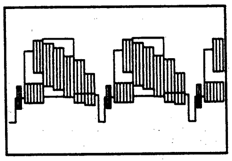
— ON SCREEN —

WF1 IC201-21
CV_IN



REC/PB 2.2 Vp-p
50 mV/20 µsec/DIV

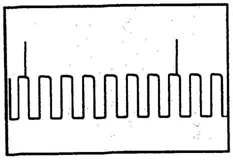
WF2 IC201-19
CVOUT



REC/PB 2.2 Vp-p
50 mV/20 µsec/DIV

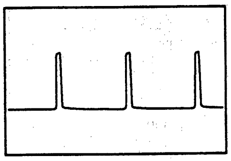
— SYSCON —

WF1 CN3001-5
D.FG



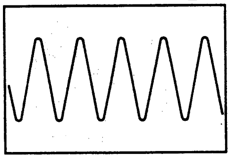
REC/PB 4.5 Vp-p
0.2 V/5 msec/DIV

WF2 CN3001-4
D.PG



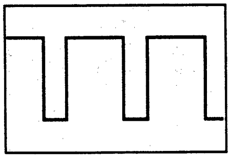
REC/PB 4.6 Vp-p
0.2 V/10 msec/DIV

WF3 CN3003-2
CAP_ FG



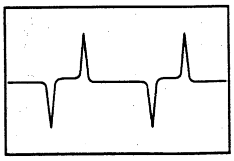
REC/PB 2.7 Vp-p
50 mV/0.5 msec/DIV

WF4 IC3001-1
CTL(+)



REC 4.0 Vp-p
0.1 V/10 msec/DIV

WF5 TP4001
CTL.P

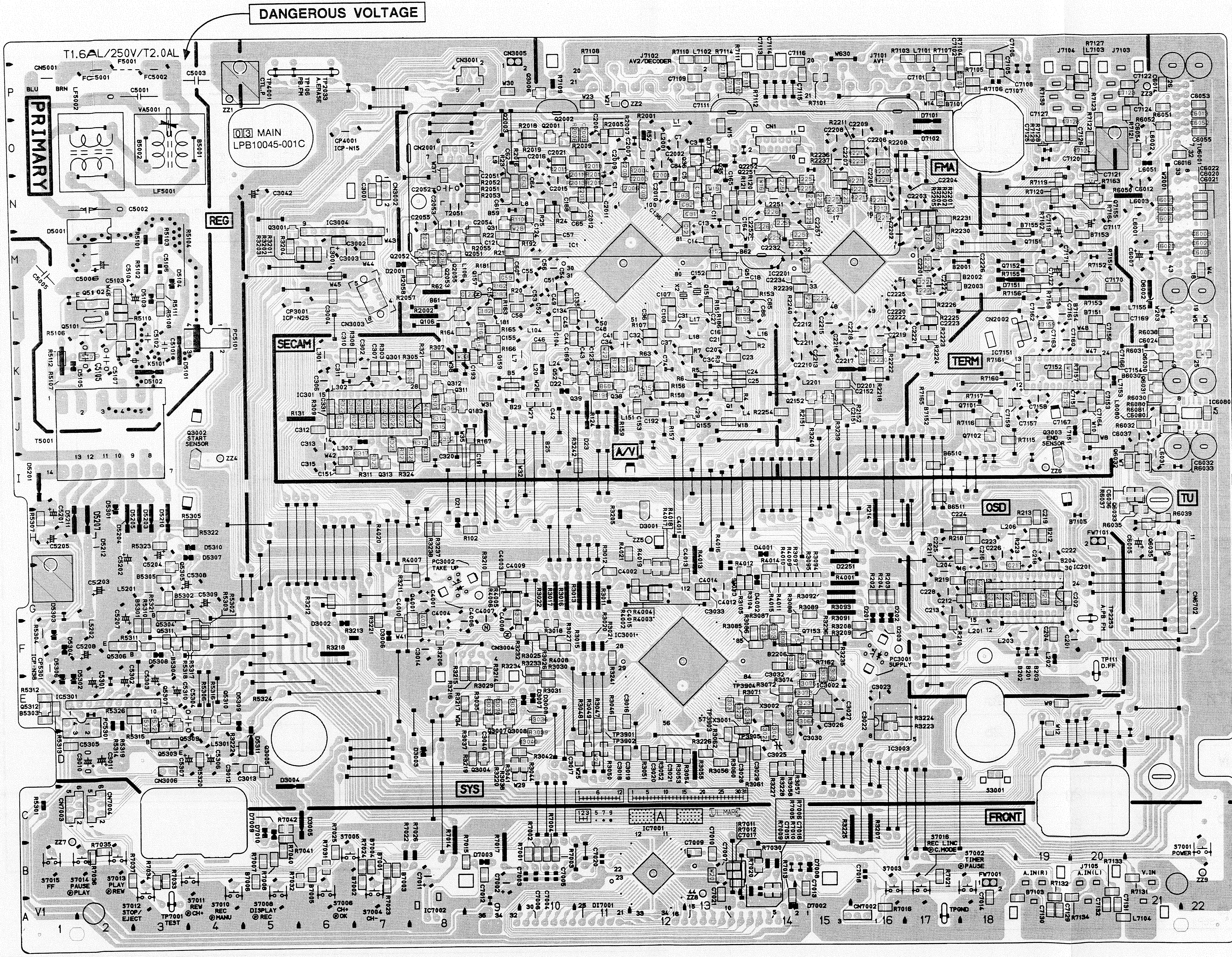


PB 2.5 Vp-p
50 mV/10 msec/DIV

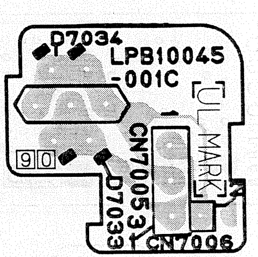
COMPONENT PARTS LOCATION GUIDE <MAIN>

REF.NO.	LOCATION		
CAPACITOR			
C1	A	D	11N
C3	B	C	13O
C5	B	C	13N
C7	A	D	12O
C9	B	C	13N
C11	B	C	13N
C12	B	C	13M
C13	A	D	13M
C14	B	C	13M
C16	B	C	13L
C18	B	C	14L
C20	A	D	13K
C21	B	C	13K
C23	B	C	13K
C24	B	C	14K
C25	B	C	14K
C27	B	C	13L
C29	A	D	13J
C30	A	D	13K
C31	B	C	12L
C32	B	C	12K
C34	A	D	11K
C36	B	C	12L
C37	A	D	12K
C40	B	C	12K
C41	B	C	11L
C42	B	C	10J
C43	B	C	11K
C44	B	C	11K
C45	B	C	11L
C46	B	C	10K
C48	A	D	11L
C49	B	C	10L
C51	A	D	10L
C52	A	D	10L
C53	A	D	10L
C54	A	D	10M
C55	A	D	10M
C56	A	D	10M
C57	B	C	10M
C58	B	C	10L
C59	B	C	9M
C60	B	C	9M
C61	B	C	10N
C62	B	C	10N
C63	B	C	10N
C64	A	D	10N
C65	B	C	11N
C74	B	C	12K
C81	B	C	13N
C82	B	C	13N
C83	B	C	13N
C84	B	C	13N
C85	B	C	14L
C86	A	D	14L
C104	B	C	10L
C107	B	C	12L
C108	B	C	12L
C121	B	C	9M
C122	B	C	9L
C123	B	C	11K
C124	B	C	10N
C134	B	C	11L
C135	B	C	11L
C136	B	C	12N
C145	B	C	11K
C151	B	C	6I
C152	B	C	13M
C153	B	C	12J
C154	A	D	9L
C155	B	C	9K
C164	B	C	13N
C165	B	C	14N
C168	B	C	11N
C169	B	C	11K
C182	B	C	9L
C183	B	C	9L
C191	B	C	9I
C192	B	C	12J
C193	B	C	9K
C201	A	D	20F
C202	B	C	19G
C204	B	C	19F
C206	B	C	19G
C207	B	C	19G
C209	B	C	19G
C210	B	C	18G
C211	B	C	18G
C212	B	C	18G
C213	A	D	17G
C214	B	C	18G
C215	B	C	18G
C216	A	D	18G
C217	B	C	19G
C218	A	D	19G
C219	B	C	19H
C221	B	C	19G
C222	A	D	19H
C223	B	C	18H
C224	B	C	18H
C225	A	D	17H
C226	A	D	18H
C227	B	C	18G
C228	A	D	17G
C301	B	C	8J
C302	A	D	7K
C303	B	C	7J
C304	B	C	7J
C305	B	C	7J
C306	A	D	6K
C307	B	C	7K
C308	B	C	7J
C309	B	C	7J
C310	B	C	6K
C311	B	C	7K
C312	B	C	6J
C313	A	D	6J
C314	B	C	6J
C315	A	D	6I
C316	B	C	7J
C317	B	C	7I
C318	B	C	8J
C319	B	C	8I
C320	B	C	8J
C321	B	C	7J
C322	B	C	7J
C331	B	C	6J
C2001	B	C	12N
C2002	A	D	12O
C2003	B	C	12N
C2004	A	D	11O
C2005	B	C	11O
C2006	B	C	12N
C2007	A	D	12O
C2008	B	C	12O
C2009	A	D	11O
C2010	A	D	12N
C2011	B	C	11N
C2012	B	C	11N
C2013	B	C	11N
C2015	A	D	10N
C2016	A	D	10O
C2021	B	C	10O
C2051	B	C	9O
C2052	A	D	9N
C2053	B	C	8M
C2054	B	C	9M
C2055	A	D	8N
C2151	B	C	15J
C2152	B	C	15K
C2201	A	D	17M
C2202	A	D	17M
C2203	A	D	17N
C2204	A	D	16N
C2205	A	D	16N
C2206	A	D	16O
C2207	A	D	15O
C2208	A	D	15O
C2209	A	D	16O
C2210	A	D	15K
C2211	A	D	15L
C2212	A	D	15L
C2213	A	D	15K
C2214	B	C	15L
C2215	A	D	15L
C2216	A	D	15K
C2217	A	D	16K
C2218	A	D	16L
C2219	A	D	16L
C2220	A	D	16L
C2221	A	D	17L
C2222	A	D	17L
C2223	B	C	17L
C2224	B	C	17L
C2225	A	D	17L
C2226	A	D	17M
C2227	A	D	17L
C2230	B	C	16N
C2231	B	C	15N
C2232	A	D	15M
C2233	B	C	15M
C2234	B	C	15M
C2251	B	C	15N
C2252	B	C	15N
C2253	B	C	15N
C2254	B	C	15N
C2255	B	C	15N
C2256	B	C	14N
C2257	A	D	15N
C2258	B	C	15N
C2259	B	C	14N
C2260	B	C	14M
C2261	B	C	14N
C3001	B	C	7N
C3002	B	C	6M
C3003	A	D	6M
C3004	B	C	6L
C3010	A	D	2D
C3011	A	D	2D
C3012	A	D	4D
C3013	B	C	5D
C3014	A	D	8F
C3016	B	C	11E
C3017	B	C	10D
C3018	B	C	11D
C3019	B	C	11D
C3020	B	C	12D
C3021	B	C	12D
C3022	B	C	16E
C3023	A	D	16E
C3024	B	C	14D
C3025	A	D	14D
C3026	B	C	15E
C3027	A	D	15E
C3028	B	C	14D
C3029	B	C	14D
C3030	A	D	15D
C3031	B	C	13E
C3032	B	C	14F
C3033	B	C	13G
C3034	B	C	15E
C3035	B	C	15E
C3036	B	C	14E
C3037	B	C	14D
C3038	B	C	14F
C3039	B	C	14F
C3040	B	C	9D
C3041	B	C	14D
C3042	A	D	5N
C4001	A	D	8G
C4002	B	C	11G
C4003	B	C	9G
C4004	A	D	8F
C4005	B	C	8F
C4006	A	D	9F
C4007	A	D	9F
C4008	A	D	9F
C4009	B	C	9G
C4010	B	C	7F
C4011	B	C	12G
C4012	A	D	13G
C4013	B	C	13G
C4014	B	C	13G
C4015	B	C	12G
C4016	A	D	13G
C5001	A	D	3P
C5002	A	D	1N
C5003	A	D	4P
C5005	A	D	1L
C5006	A	D	2M
C5101	A	D	3K
C5102	A	D	3K
C5103	B	C	2L
C5104	A	D	3L
C5105	A	D	2K
C5106	A	D	3M
C5107	A	D	2K
C5201	A	D	1I
C5202	A	D	2H
C5203	A	D	2G
C5204	A	D	3H
C5205	A	D	1H
C5207	A	D	2F
C5208	A	D	2F
C5301	A	D	2E
C5302	A	D	2E
C5303	A	D	3E
C5304	A	D	4D
C5305	B	C	1D
C5306	A	D	4D
C5307	A	D	4D
C5308	A	D	3G
C5309	A	D	4G
C5310	A	D	3E
C6005	A	D	21H
C6006	B	C	22M
C6007	A	D	21M
C6008	B	C	22M
C6012	A	D	21N
C6013	B	C	22O
C6014	B	C	21P
C6016	B	C	22O
C6020	B	C	22N
C6021	B	C	22N
C6022	B	C	22N
C6023	B	C	22M
C6024	B	C	21K
C6032	B	C	21I
C6036	B	C	21I
C6037	A	D	21J
C6052	B	C	22O
C6053	B	C	22P
C6054	B	C	21O
C6055	B	C	22O
C6080	B	C	21J
C7002	A	D	9B
C7003	A	D	10B
C7004	A	D	10B
C7005	A	D	10B
C7006	A	D	10B
C7007	A	D	13B
C7009	B	C	13B
C7010	B	C	13B
C7011	A	D	8B
C7012	B	C	9B
C7013	B	C	15B
C7014	B	C	18A
C7015	A	D	14B
C7016	B	C	14A
C7017	B	C	13B
C7018	A	D	16B
C7020	A	D	11B
C7021	B	C	13A
C7101	B	C	17P
C7102	B	C	17P
C7103	B	C	17P
C7104	B	C	18P
C7105	B	C	18P
C7106	B	C	18P
C7107	A	D	18P
C7108	B	C	18P
C7109	B	C	13P
C7110	B	C	13P
C7111	B	C	13P
C7112	B	C	13P
C7113	B	C	14P
C7114	B	C	14P
C7115	B	C	15P
C7116	B	C	15P
C7117	A	D	20N
C7119	A	D	19M
C7120	B	C	20O
C7121	B	C	20O
C7122	B	C	21P
C7123	B	C	21P
C7124	B	C	21P
C7125	B	C	19O
C7126	B	C	20O
C7127	B	C	19O
C7128	B	C	20O
C7129	B	C	19A
C7130	B	C	19A
C7131	B	C	20A
C7132	B	C	20A
C7151	A	D	20J
C7152	B	C	19K
C7153	B	C	20J
C7154	B	C	20K
C7155	B	C	19J
C7156	B	C	20L
C7157	A	D	19J
C7158	A	D	19J
C7159	A	D	19J
C7160	A	D	20K
C7161	A	D	19L
C7162	A	D	19L
C7163	A	D	19K
C7164	B	C	20J
C7166	B	C	20K
C7167	B	C	20J
C7169	B	C	21L
C7170	B	C	20L
C7171	B	C	20M
C7172	A	D	19L
CONNECTOR			
CN1	A	D	14O
CN2001	A	D	9O
CN2002	A	D	19L
CN3001	A	D	9P
CN3002	A	D	7N
CN3003	A	D	7L
CN3004	A	D	9F
CN3005	A	D	10P
CN3006	A	D	3D
CN5001	A	D	1P
CN6702	A	D	22F
CN7002	A	D	16A
CN7003	A	D	1C
CN7004	A	D	2C
DIODE			
D21	A	D	8H
D22	A	D	11K
D23	A	D	11J
D201	A	D	16G
D202	A	D	16G
D203	A	D	16G
D2001	A	D	7M
D2201	A	D	15K
D2251	A	D	15G
D3001	A	D	12H
D3002	A	D	6F
D3003	A	D	8D
D3004	A	D	5C
D3005	A	D	6C
D3006	A	D	7F
D3007	A	D	10E
D3008	A	D	10E
D4001	A	D	14H
D4002	A	D	14G
D5001	B	C	2M
D5101	A	D	3K
D5102	A	D	3K
D5103	A	D	3L
D5104	A	D	3M
D5105	A	D	2K
D5201	A	D	1I
D5203	A	D	3I
D5204	A	D	2I
D5205	A	D	3I
D5207	A	D	2I
D5210	A	D	3I
D5211	A	D	2H
D5212	A	D	2I
D5301	A	D	2I
D5302	A	D	2F
D5303	A	D	1F
D5304	A	D	1F
D5306	A	D	1F
D5307	A	D	3H
D5308	A	D	3F
D5309	A	D	4D
D5310	A	D	4H
D5311	A	D	5D
D6002	A	D	21M
D7002	A	D	14A
D7003	A	D	9B
D7008	A	D	15B
D7009	A	D	5B
D7010	A	D	5B
D7033	A	D	20C
D7102	A	D	17O
D7151	A	D	19M
IC			
IC1	B	C	12M
IC201	A	D	19F
IC301	A	D	8J
IC2201	B	C	16M
IC3001	B	C	13F
IC3002	B	C	15E
IC3003	A	D	16E
IC3004	A	D	7M
IC5301	A	D	1E
IC6080	B	C	22J
IC7001	B	C	12B
IC7002	A	D	8A
IC7151	A	D	20K
JACK			
J7101	A	D	16P
J7102	A	D	12P
J7103	A	D	21P
J7104	A	D	20P
J7105	A	D	20A
COIL			
L1	A	D	12O
L2	A	D	14L
L4	A	D	14J
L7	A	D	10K
L8	A	D	10N
L9	A	D	9O
L16	A	D	14L
L17	A	D	13L
L18	A	D	13K
L20	A	D	10K
L24	A	D	11K
L104	A	D	10L
L106	A	D	9L
L151	A	D	12J
L181	A	D	9L
L201	A	D	18F
L202	A	D	19E
L203	A	D	19F
L204	A	D	17G
L206	A	D	19H
L301	A	D	6K
L302	A	D	7K
L303	A	D	7J
L2001	A	D	12O
L2201	A	D	15K
L2251	A	D	14N
L2252	A	D	14M
L3001	A	D	6M
L5201	A	D	3G
L5202	A	D	2F
L5301	A	D	4D
L6001	A	D	21M
L6002	A	D	21O
L6003	A	D	21N
L6031	A	D	21I
L6051	A	D	21O
L6080	A	D	21J
L7101	B	C	17P
L7102	B	C	13P
L7103	B	C	20P
L7104	B	C	20A
L7151	A	D	20J
L7153	A	D	20K
L7155	A	D	21L
TRANSISTOR			
Q1	B	C	13J
Q31	B	C	9N
Q34	B	C	13N
Q35	B	C	13N
Q36	B	C	13O
Q37	B	C	13O
Q38	B	C	11K
Q39	B	C	11K
Q51	B	C	14M
Q52	B	C	11K
Q106	B	C	9L
Q151	B	C	13L
Q152	B	C	13M
Q153	B	C	12K
Q154	B	C	12K
Q155	B	C	13J
Q157	B	C	9M
Q158	B	C	9K
Q159	B	C	9K
Q183	B	C	9J
Q301	B	C	7K
Q302	B	C	8J
Q311	B	C	8J
Q312	B	C	8K
Q313	B	C	7I
Q2001	B	C	10O
Q2002	B	C	10O
Q2003	B	C	10O
Q2051	B	C	9M
Q2052	B	C	8M
Q2053	B	C	8M
Q2054	B	C	8M
Q2055	B	C	8M
Q2151	B	C	15J
Q2152	B	C	15J
Q2251	B	C	14N
Q2252	B	C	15N
Q2253	B	C	14M
Q3001	B	C	6M
Q3002	A	D	4I
Q3003	A	D	19I
Q3004	B	C	9D
Q3005	B	C	5D
Q3006	B	C	10P
Q3007	B	C	9E
Q3008	B	C	9E
Q4001	B	C	8F
Q5101	A	D	2L
Q5102	A	D	2L
Q5303	A	D	3D
Q5304	A	D	3G
Q5305	B	C	3G
Q5306	A	D	2F
Q5307	B	C	3E
Q5308	B	C	3E
Q5309	B	C	3E
Q5310	B	C	4E
Q5311	B	C	3F
Q5312	B	C	1E
Q6030	B	C	21K
Q6031	B	C	21K
Q6032	B	C	21I
Q6033	B	C	21H
Q6035	B	C	21H
Q7101	B	C	18J
Q7102	B	C	18J
Q7151	B	C	19M
Q7152	B	C	19M
Q7153	B	C	15F
Q7154	B	C	15F
Q7155	B	C	20N
Q7156	B	C	20N
RESISTOR			
R1	B	C	13M
R2	B	C	14K
R3	B	C	13K
R4	B	C	14J
R5	B	C	13K
R6	B	C	13K
R7	B	C	13K
R20	B	C	10L
R21	B	C	9M
R22	B	C	9M
R23	B	C	9N
R24	B	C	10N
R25	B	C	10N
R52	A	D	12O
R62	A	D	8L
R63	B	C	12K
R102	B	C	9H
R107	B	C	12L
R110	B	C	10N
R120	B	C	14N
R121	B	C	14N
R122	B	C	11K
R123	B	C	11K
R124	B	C	11K
R131	A	D	6J
R151	B	C	13L
R152	B	C	14L
R153	B	C	14L
R154	B	C	12K
R155	B	C	14L
R156	B	C	12K
R157	B	C	12J
R158	B	C	12J
R159	A	D	11J
R161	B	C	9L
R162	B	C	9L
R163	B	C	9L
R164	B	C	9L
R165	B	C	9L
R166	B	C	9K
R167	B	C	9J
R181	B	C	9M
R186	B	C	13L
R190	B	C	11K
R191	B	C	11J
R192	B	C	10M
R202	B	C	16G
R203	B	C	16G
R204	B	C	16G
R209	B	C	18G
R210	B	C	17F
R211	B	C	18H
R213	B	C	19H
R214	A	D	16H
R216	B	C	19G
R218	B	C	18H
R219	B	C	17G
R223	B	C	19H
R301	B	C	8J
R302	B	C	7J
R303	B	C	7K
R304	B	C	8K
R305	B	C	8K
R306	B	C	7J
R307	B	C	8K
R308	B	C	7K
R309	B	C	6J
R310	B	C	7J
R311	B	C	7I
R312	B	C	8J
R313	B	C	8J
R314	B	C	8J
R315	B	C	8J
R316	B	C	8J
R321	B	C	8K
R322	B	C	6J
R323	B	C	7J
R324	B	C	8I
R325	B	C	7I
R326	B	C	7J
R327	B	C	7I
R328	B	C	8I
R329	B	C	7J
R2001	B	C	12O
R2002	A	D	8L
R2003	B	C	12N
R2004	B	C	12O
R2005	B	C	11O
R2006	B	C	11O
R2007	B	C	11O
R2009	B	C	11O
R2010	B	C	11O
R2011	B	C	11N
R2012	B	C	11N
R2013	B	C	11N
R2014	B	C	11N
R2015	B	C	10O
R2016	B	C	10O
R2018	B	C	10O
R2019	B	C	10O
R2051	B	C	9N
R2052	B	C	9N
R2053	B	C	9N
R2054	B	C	8M
R2055	B	C	9M
R2056	B	C	8M
R2057	B	C	8M
R2058	B	C	8M
R2059	B	C	8M
R2060	B	C	8M
R2151	B	C	15J
R2152	B	C	16J
R2201	B	C	17N
R2202	B	C	17N
R2203	B	C	17M
R2204	B	C	17N
R2205	B	C	17N
R2206	B	C	16N
R2207	B	C	16N
R2208	B	C	16O
R2209	B	C	16O
R2210	B	C	16O
R2211	B	C	16O
R2212	B	C	16N
R2213	B	C	16N
R2214	B	C	16N
R2215	B	C	16N
R2216	B	C	16N
R2217	B	C	16N
R2218	B	C	16K
R2219	B	C	16K
R2220	B	C	16K
R2221	B	C	16K
R2222	B	C	16K
R2223	B	C	17L
R2224	B	C	17L
R2225	B	C	17L
R2226	B	C	17L
R2227	B	C	17L
R2228	B	C	17M
R2229	B	C	17M
R2230	B	C	17M
R2231	B	C	17N
R2236	B	C	15N
R2237	B	C	15N
R2238	B	C	15M
R2239	B	C	15L
R2240	B	C	15L
R2251	B	C	15L
R2252	B	C	15M
R2254	B	C	14J
R3011	A	D	11G
R3012	A	D	11G
R3013	A	D	11G
R3014	B	C	10F
R3015	A	D	11F
R3016	A	D	10G
R3017	A	D	10G
R3018	B	C	10F
R3020	A	D	11F
R3021	A	D	11F
R3022	A	D	10G
R3025	B	C	10F
R3026	B	C	10F
R3027	B	C	10F
R3029	B	C	9E
R3030	B	C	10E
R3031	B	C	10E
R3033	B	C	9E
R3034	B	C	9E
R3035	B	C	9E
R3036	B	C	10E
R3037	B	C	9D
R3038	B	C	9D
R3039	B	C	10D
R3040	B	C	10D
R3041	B	C	9D
R3042	B	C	10D
R3044	B	C	10D
R3046	B	C	11E
R3047	B	C	11D
R3048	B	C	11D
R3049	B	C	11D
R3050	B	C	11D
R3051	B	C	12D
R3052	B	C	12D
R3053	B	C	12D
R3054	B	C	13D
R3055	A	D	13C
R3056	B	C	13D
R3057	B	C	15D
R3058	B	C	14D
R3060	B	C	13D
R3061	B	C	14D
R3062	B	C	13D
R3066	B	C	15E
R3069	B	C	14E
R3071	B	C	14E
R3072	B	C	14E
R3073	B	C	15E
R3074	B	C	14E
R3075	B	C	15E
R3076	B	C	15E
R3080	B	C	15F
R3081	B	C	14F
R3083	B	C	14F
R3085	B	C	14F
R3086	B	C	14F
R3087	B	C	14F
R3088	B	C	15F
R3089	B	C	15F
R3091	A	D	16G
R3092	A	D	16G
R3093	A	D	16G
R3094	B	C	15G
R3095	B	C	15G
R3097	B	C	15G
R3098	B	C	9E
R3104	B	C	14G
R3105	B	C	14G
R3201	B	C	6M
R3202	B	C	6M
R3203	B	C	6M
R3204	B	C	5M
R3205	A	D	11H
R3206	B	C	8F
R3207	A	D	16B
R3208	B	C	16F
R3209	B	C	16F
R3210	B	C	9G
R3211	B	C	8G
R3212	B	C	6G
R3213	A	D	7F
R3214	B	C	9E
R3215	B	C	9E
R3216	B	C	9E
R3217	B	C	9E
R3218	A	D	7F
R3219	B	C	9D
R3220	B	C	9D
R3221	B	C	7F
R3222	B	C	5D
R3223	B	C	16D
R3224	B	C	16E
R3225	A	D	16B
R3226	B	C	13D
R3227	B	C	14D
R3228	B	C	14D
R3229	B	C	14E
R3230	B	C	15E
R3231	B	C	15E
R3232	B	C	10F
R3233	B	C	10E
R3234	B	C	10E
R3235	B	C	15F
R3236	B	C	15F
R3237	B	C	8H
R3238	B	C	8H
R3239	B	C	15J
R3240	B	C	15J
R3241	B	C	11F
R3242	B	C	11I
R4001	A	D	16G
R4002	B	C	12G
R4003	B	C	12G
R4004	B	C	12G
R4005	B	C	9G
R4006	B	C	9G
R4007	B	C	8G
R4008	B	C	10F
R4009	B	C	14G
R4010	B	C	14G
R4011	B	C	14G
R4012	B	C	14G
R4013	A	D	13G
R4014	B	C	14G
R4015	B	C	14G
R4016	A	D	13G
R4017	B	C	12G
R4018	B	C	12G
R4019	B	C	12G
R4020	A	D	7G
R4021	B	C	12H
R5101	A	D	3M
R5102	A	D	3M
R5103	A	D	3M
R5104	A	D	4N
R5106	A	D	2L
R5107	A	D	1K
R5108	B	C	3L
R5109	B	C	2K
R5110	B	C	2L
R5111	B	C	3L
R5112	B	C	1K
R5301	A	D	1C
R5302	B	C	4F
R5303	B	C	4F
R5304	A	D	1F
R5305	B	C	4H
R5306	B	C	4E
R5307	B	C	1H
R5310	B	C	3F
R5311	B	C	3F
R5312	B	C	1E
R5313	B	C	1E
R5314	A	D	2D
R5315	B	C	3E
R5316	B	C	4E
R5317	B	C	4F
R5318	B	C	4F
R5319	A	D	2D
R5320	B	C	4D
R5321	B	C	3G
R5322	B	C	4H
R5323	B	C	3H
R5324	A	D	5E
R5325	B	C	3E
R5326	B	C	3E
R5327	B	C	3E
R6020	B	C	21N
R6021	B	C	21N
R6022	B	C	21N
R6023	B	C	21M
R6030	B	C	21J
R6031	B	C	21K
R6032	B	C	21J
R6033	B	C	21I
R6035	B	C	21H
R6037	B	C	21I
R6038	B	C	21L
R6039	B	C	21H
R6050	A	D	21N
R6051	B	C	21P
R6052	B	C	21O
R6080	B	C	21J
R6081	B	C	21J
R7001	B	C	10B
R7002	B	C	10B
R7003	B	C	10B
R7004	B	C	10B
R7005	A	D	14B
R7006	A	D	14B
R7007	B	C	5B
R7008	B	C	5B
R7009	A	D	14A
R7010	B	C	14A
R7011	B	C	13B
R7012	B	C	13B
R7013	B	C	14A
R7014	A	D	8B
R7015	B	C	9B
R7016	B	C	16A
R7017	A	D	9B
R7020	B	C	14B
R7021	B	C	17B
R7022	A	D	7B
R7023	B	C	7B
R7024	B	C	7B
R7025	B	C	6B
R7026	A	D	8B
R7030	B	C	14B
R7031	B	C	6B
R7032	B	C	6B
R7033	B	C	3B
R7034	B	C	3B
R7035	B	C	2B
R7036	B	C	2B
R7037	B	C	3B
R7040	B	C	5B
R7041	B	C	5B
R7042	B	C	5C
R7101	B	C	15P
R7102	B	C	20M
R7103	B	C	17P
R7104	B	C	18P
R7105	B	C	18P
R7106	B	C	18P
R7107	B	C	17P
R7108	B	C	11Q
R7109	A	D	10P
R7110	B	C	13P
R7111	B	C	14P
R7112	B	C	14P
R7113	B	C	14P
R7114	B	C	13P
R7115	B	C	18J
R7116	B	C	18J
R7117	B	C	18J
R7119	B	C	19N
R7120	B	C	19N
R7121	B	C	21O
R7122	B	C	20O
R7123	B	C	20O
R7124	B	C	20O
R7127	B	C	20P
R7128	B	C	20O
R7129	B	C	19O
R7130	B	C	20P
R7131	B	C	21B
R7132	B	C	19A
R7133	B	C	20A
R7134	B	C	20A
R7151	A	D	20M
R7152	A	D	20M
R7153	A	D	20L
R7155	B	C	19M
R7156	B	C	19L
R7157	B	C	20K
R7158	B	C	19L
R7159	B	C	19L
R7160	B	C	19K
R7161	B	C	19K
R7162	B	C	15F
R7163	B	C	20N
R7164	B	C	20N
R7165	B	C	17J
SWITCH			
S3001	A	D	18C
S7001	A	D	22B
S7002	A	D	18B
S7003	A	D	16B
S7004	A	D	7B
S7005	A	D	6B
S7006	A	D	6B
S7008	A	D	5B
S7010	A	D	4B
S7011	A	D	4B
S7012	A	D	3B
S7013	A	D	2B
S7014	A	D	2B
S7015	A	D	1B
S7016	A	D	17B
TEST POINT			
TP106	A	D	6P
TP111	A	D	20E
TP2033	A	D	6P
TP2253	A	D	20G
TP3901	B	C	11D
TP3902	B	C	11D
TP3903	B	C	13D
TP3904	B	C	14E
TP3905	B	C	14D
TP4001	A	D	5P
TP7001	A	D	3A
TPGND	A	D	17A
OTHER			
CP3001	A	D	6L
CP4001	A	D	7O
CP5301	A	D	1F
DI7001	A	D	12A
F5001	A	D	2P
FW7001	A	D	18B
FW7101	A	D	20H
K5101	A	D	3K
LF5001	A	D	4O
LF5002	A	D	2N
PC3001	A	D	16F
PC3002	A	D	8G
PC5101	A	D	4L
PC5301	A	D	2E
T2051	A	D	9N
T5001	A	D	1K
TU6001	A	D	22P
VA5001	A	D	4O
X1	A	D	13L
X2	A	D	13L
X3001	A	D	13D
X3002	A	D	14E

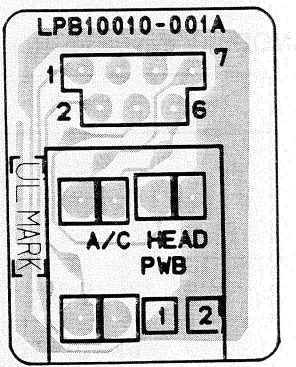
4.9 MAIN, A/C HEAD AND LED CIRCUIT BOARDS


DANGEROUS VOLTAGE
T1.6AL/250V/T2.0AL
PRIMARY
03 MAIN
LPB10045-001C
REG
SECAM
FMA
TERM
A/V
OSD
TU
SYS
FRONT
Q3002 START SENSOR
Q3003 END SENSOR
PC3002 TAKE UP
PC3001 SUPPLY
S7001 POWER
S7002 TIMER PAUSE
S7016 REC LINK C.MODE
S7015 FF
S7014 PAUSE PLAY
S7013 PLAY REW
S7012 STOP/EJECT
S7011 REW CH+
S7010 REC MANU
S7006 DISPLAY REC
S7005 CH+ OK
S7004 CH-
TP7001 TEST
A.IN(R)
A.IN(L)
V.IN
J7102 AV2/DECODER
J7101 AV1
CN5001
F5001
T5001
IC7001
IC3001
IC201
IC301
IC3003

— LED —

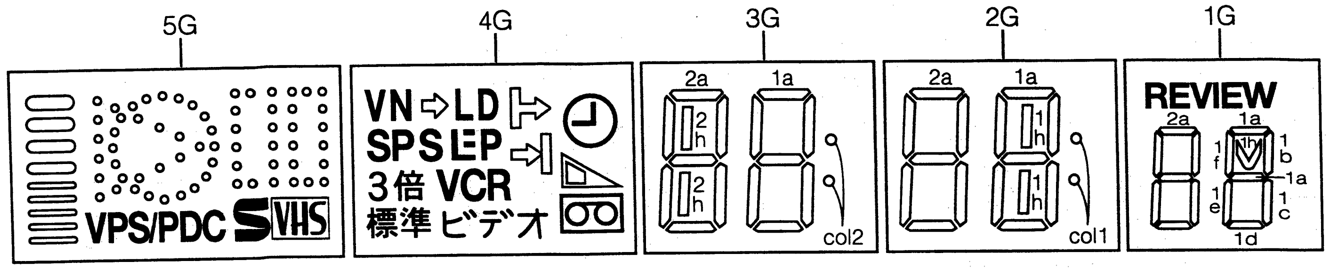

D7034
LPB10045
-001C
90
CN7005
D7033
CN7006
UL MARK

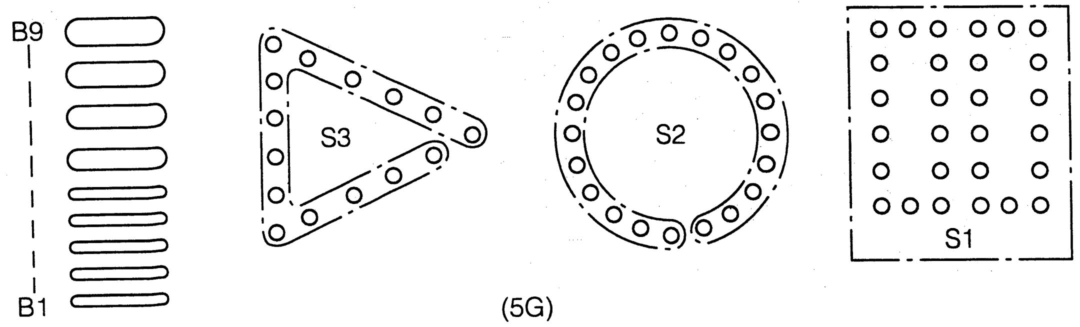
— A/C HEAD —


LPB10010-001A
1
2
7
6
UL MARK
A/C HEAD
PWB
1
2

4.10 FDP GRID ASSIGNMENT AND ANODE CONNECTION

GRID ASSIGNMENT


5G
4G
3G
2G
1G
VPS/PDC
SVHS
VN⇨LD
SPS LP
3倍 VCR
標準 ビデオ
2a
1a
2h
col2
col1
REVIEW
1b
1f
1e
1c
1d


B9
B1
S3
S2
S1

(5G)

ANODE CONNECTION

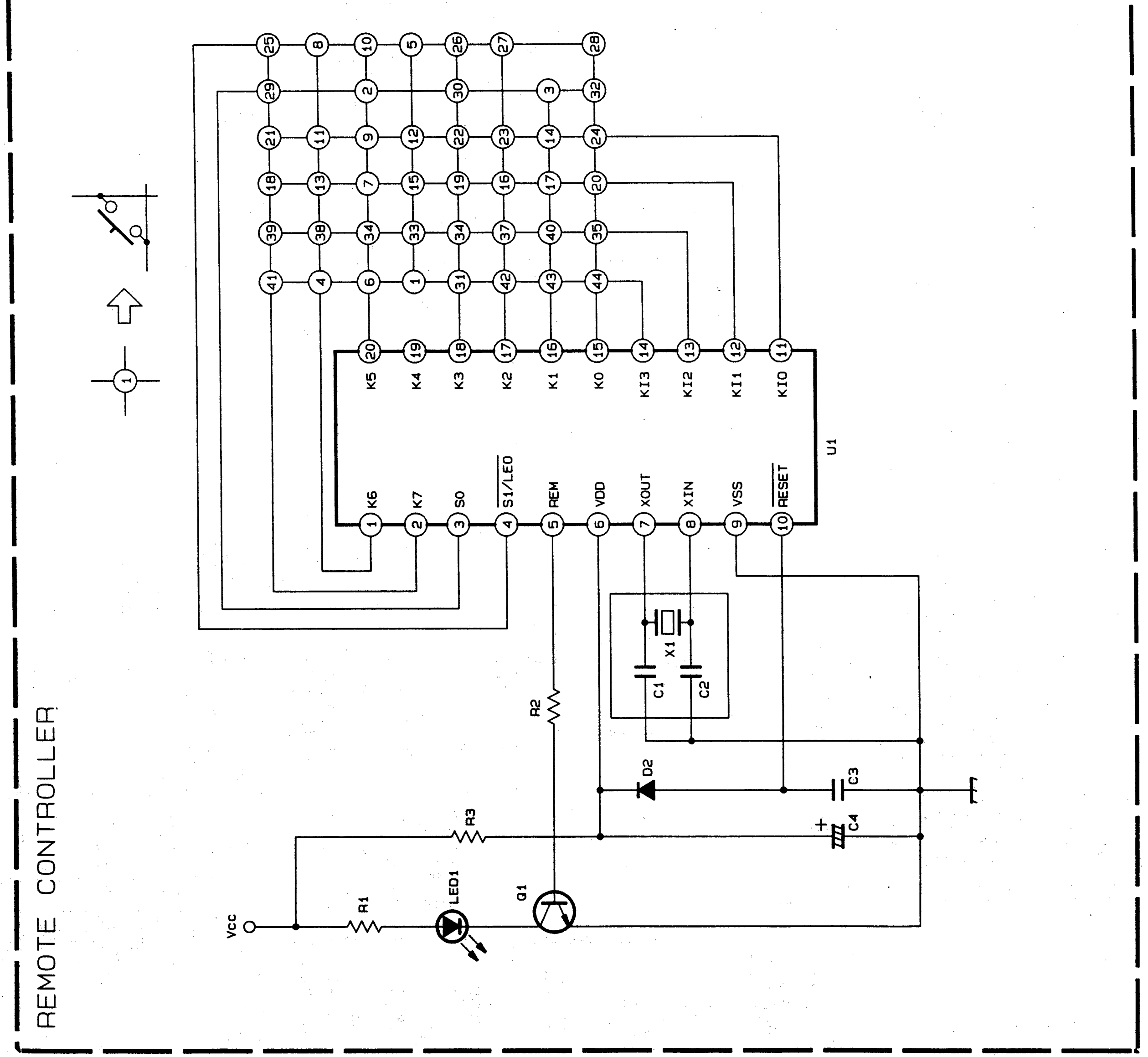
	5G	4G	3G	2G	1G
P 1	S2	|▷	1a	1a	1a
P 2	S1	⇨|	1b	1b	1b
P 3	S3	3倍	1f	1f	1f
P 4	VPS/PDC	標準	1g	1g	1g
P 5	SVHS	◷	1c	1c	1c
P 6	—	◺	1e	1e	1e
P 7	—	📼	1d	1d	1d
P 8	B9	VCR	col2	1h	1h
P 9	B8	ビデオ	2a	2a	2a
P10	B7	⇨	2b	2b	2b
P11	B6	VN	2f	2f	2f
P12	B5	LD	2g	2g	2g
P13	B4	SP	2c	2c	2c
P14	B3	S (SEP)	2e	2e	2e
P15	B2	: (SEP)	2d	2d	2d
P16	B1	LP(SEP)	2h	col1	REVIEW

4.11 REMOTE CONTROL SCHEMATIC DIAGRAM

NOTES:
1. All parts shown in this schematic are critical for safety.
2. This schematic is only for reference.
Avoid replacing individual parts.
Replace the entire unit only.

Key No.	Key Name
1	TV
2	ENTER/OSD
3	C.MEMORY
4	POWER
5	RE-VIEW
6	TV/VCR
7	AUDIO/MUTE
8	DISPLAY
9	DIGIT1
10	DIGIT2
11	DIGIT3
12	DIGIT4
13	DIGIT5
14	DIGIT6
15	DIGIT7
16	DIGIT8
17	DIGIT9
18	CANCEL
19	DIGIT0
20	TIMER
21	START+
22	STOP+
23	DATE+
24	VIDEO CH+
25	START-
26	END-
27	DATE-
28	VIDEO CH-
29	PROG
30	PROG CHECK
31	-/-- MAIN/SUB
32	SKIP
33	RE-VIEW
34	PLAY
35	FF
36	RECORD
37	STOP
38	PAUSE
39	MENU
40	OK
41	<</VOLUME-
42	Δ/TV CH+
43	>>/VOLUME+
44	∇/TV CH-
36+34	REC START
36+38	REC PAUSE

LP20351-009A


U1
K5
K4
K3
K2
K1
K0
KI3
KI2
KI1
KI0
K6
K7
S0
S1/LEO
REM
VDD
XOUT
XIN
VSS
RESET
X1
C1
C2
C3
C4
D2
R1
R2
R3
Q1
LED1
Vcc
REMOTE CONTROLLER

4.12 VOLTAGE CHARTS

<VIDEO/N -AUDIO>

MODE PIN NO.	REC	PLAY
IC1		
1	2.5	2.5
2	2.5	2.5
3	0	0
4	2.2	2.5
5	0	0
6	2.8	2.8
7	2.5	2.5
8	2.5	2.5
9	2.5	2.5
10	2.5	2.5
11	2.5	2.5
12	5.0	5.0
13	1.9	1.5
14	1.9	1.5
15	2.6	3.0
16	1.5	0.8
17	0.3	0.7
18	2.3	2.3
19	3.0	3.0
20	2.8	2.8
21	2.3	2.3
22	1.9	2.1
23	3.0	3.0
24	2.1	2.1
25	1.4	1.4
26	2.1	2.1
27	0	0
28	2.8	2.8
29	1.9	1.9
30	2.8	2.8
31	2.8	2.8
32	0	0
33	0	0
34	0	0
35	3.1	3.1
36	5.1	5.1
37	0	0
38	5.1	5.1
39	3.3	3.3
40	5.1	5.1
41	5.1	5.1
42	2.0	2.0
43	5.1	5.1
44	2.6	2.6
45	0	0
46	2.0	2.0
47	0	0
48	0	0
49	0	0
50	0.4	0.4
51	0.1	0.1
52	2.3	2.3
53	2.8	2.8
54	2.0	2.0
55	2.1	2.1
56	2.3	2.3
57	0	0
58	3.1	3.1
59	2.8	2.8
60	2.1	2.1
61	5.0	5.0
62	5.1	5.1
63	5.0	5.0
64	0	0
65	1.1	2.3
66	5.0	5.0
67	5.0	5.0
68	0	0
69	2.8	2.8
70	2.6	2.6
71	2.1	2.1
72	2.3	2.3
73	-	-
74	2.6	1.0
75	-	-
76	2.3	2.3
77	4.7	4.7
78	2.7	2.7
79	4.4	2.0
80	0	0
81	-	-
82	1.2	1.2
83	2.3	2.3
84	0	2.0
85	0	0
86	2.4	2.2
87	2.4	2.2
88	2.5	2.3
89	2.5	2.3
90	5.0	5.0
91	0	0
92	0	0
93	0	0
94	0	0
95	0.4	0.4
96	5.0	5.0
97	0	0
98	5.1	5.1
99	0.5	2.6
100	2.5	2.5
Q38		
E	1.7	1.7
C	5.0	5.0
B	2.3	2.3
Q39		
E	2.3	2.3
C	0	0
B	1.7	1.7
Q152		
E	5.0	2.7
C	0	0
B	4.4	2.0
Q2001		
E	-12.7	0
C	0	0
B	-19.2	0.7
Q2002		
E	-12.7	0
C	0	0
B	-18.9	0.7
Q2003		
E	5.1	5.1
C	-19.0	5.0
B	5.0	0
Q2051		
E	0	0
C	8.2	0.2
B	0.5	0.2
Q2052		
E	11.8	11.8
C	11.6	0.6
B	11.0	11.7
Q2053		
E	0	0
C	0	11.7
B	5.0	0
Q2054		
E	11.6	0.6
C	11.4	0.1
B	10.8	0.6
Q2055		
E	0	0
C	0	0.6
B	5.0	0
CN1		
1	0	0
2	0	0
3	0	0
4	0	0
5	2.5	2.2
6	2.5	2.2
7	2.4	2.2
8	2.4	2.2
9	2.6	0
10	2.5	0
11	2.5	0
CN2001		
1	0	0
2	0	0
3	0	0
4	0	0
5	0	0
6	2.3	2.6
7	2.5	2.5
CN2002		
1	0	0
2	0	0

<ON SCREEN>

MODE PIN NO.	REC	PLAY
IC201		
1	0	0
2	2.7	2.7
3	5.1	5.1
4	0	0
5	4.4	4.4
6	2.5	2.5
7	2.5	2.5
8	5.1	5.1
9	3.2	3.2
10	4.6	4.6
11	3.7	0.9
12	5.1	5.1
13	3.0	3.0
14	3.0	3.0
15	0	0
16	1.3	1.3
17	0	0
18	5.1	5.1
19	2.3	2.3
20	0	0
21	2.3	2.3
22	0.4	1.0
23	5.1	5.1
24	2.9	2.9
25	2.5	2.5
26	5.1	5.1
27	4.4	4.4
28	3.7	3.7
29	5.1	5.1
30	5.1	5.1

<SYSCON>

MODE PIN NO.	REC	PLAY
IC3001		
1	2.9	2.6
2	0	0
3	2.0	2.5
4	2.6	2.6
5	-	-
6	2.6	2.6
7	2.5	2.5
8	2.6	2.6
9	5.1	5.1
10	5.1	5.1
11	-	-
12	-	-
13	0	2.0
14	5.0	5.0
15	5.0	5.0
16	-	-
17	-	-
18	-	-
19	-	-
20	4.7	4.7
21	4.0	4.0
22	-	-
23	0	0
24	5.0	5.0
25	0	0
26	5.2	5.2
27	5.2	5.2
28	5.1	5.1
29	5.1	5.1
30	-	-
31	-	-
32	0	0
33	-	-
34	-	-
35	0	0
36	0	0
37	-	-
38	5.1	5.1
39	0.3	0.3
40	0	0
41	5.2	5.2
42	4.7	4.7
43	0	0
44	5.0	5.0
45	5.1	5.1
46	0.5	0.5
47	5.2	5.2
48	0	0
49	5.0	5.0
50	5.0	5.0
51	5.2	5.2
52	3.6	0.9
53	4.6	4.6
54	-	-
55	-	-
56	0	0
57	0	0
58	0	0
59	-	-
60	0	0
61	0	0
62	0	0
63	0	0
64	-	-
65	-	-
66	-	-
67	-	-
68	0	0
69	-	-
70	5.1	5.1
71	5.1	5.1
72	5.0	5.0
73	5.1	5.1
74	5.1	5.1
75	4.3	4.3
76	4.4	4.4
77	-	-
78	-	-
79	-	-
80	0	0
81	-	-
82	5.1	5.1
83	-	-
84	0	0
85	0	0
86	4.8	4.8
87	5.1	0
88	-	-
89	-	-
90	-	-
91	3.1	3.1
92	5.1	5.1
93	5.1	5.1
94	-	-
95	-	-
96	-	-
97	5.1	0
98	0.3	0.3
99	-	-
100	-	-
101	2.5	2.5
102	1.3	1.3
103	-	-
104	-	-
105	0	5.1
106	-	-
107	0	0
108	1.6	1.6
109	5.1	5.1
110	0	0
111	0	0
112	2.6	2.6
IC3002		
1	5.1	5.1
2	5.1	5.1
3	0	0
IC3003		
1	0	0
2	0	0
3	0	0
4	0	0
5	4.4	4.4
6	4.4	4.4
7	0	0
8	5.2	5.2
IC3004		
1	0	0
2	12.5	12.5
3	0.2	0.2
4	-	-
5	0	0
6	12.5	12.5
7	0.3	0.3
8	12.5	12.5
9	0	0
Q3001		
E	0	0
C	12.5	12.5
B	0	0
Q3002		
E	0	0
C	5.0	5.0
Q3003		
E	0	0
C	5.0	5.0
Q3004		
E	0	0
C	0	0
B	0.7	0.7
Q3005		
E	5.1	5.1
C	5.9	5.9
B	5.8	5.8
Q4001		
E	0	0
C	0	0
B	5.0	5.0
CN3001		
1	12.4	12.4
2	0	0
3	1.4	1.4
4	0	0
5	1.6	1.6
CN3002		
1	0.1	0.1
2	0.1	0.1
CN3003		
1	0	0
2	2.5	2.5
3	2.5	2.5
4	5.1	5.1
5	0	0
6	5.1	5.1
7	-	-
8	12.4	12.4
CN3004		
1	5.2	5.2
2	5.2	5.2
3	0	0
4	0	0

<SW.REG>

MODE PIN NO.	REC	PLAY
IC5301		
1	6.0	6.0
2	5.1	5.1
3	4.8	4.8
4	0	0
5	12.4	12.4
6	11.8	11.8
7	12.5	12.5
8	12.5	12.5
9	1.3	1.3
10	11.2	11.2
Q5101		
S	-	-
D	150.0	-
G	-	-
Q5102		
E	0	0
C	-	-
B	-	-
Q5303		
E	5.3	5.3
C	6.0	6.0
B	5.9	5.9
Q5304		
E	11.8	11.8
C	12.5	12.5
B	12.5	12.5

<TUNER>

MODE PIN NO.	REC	PLAY
IC6080		
1	1.2	1.2
2	1.5	1.5
3	2.7	2.7
4	0	0
5	4.0	4.0
6	4.0	4.0
7	4.0	4.0
8	11.7	11.7
Q6030		
E	0.7	0.7
C	0	0
B	0	0
Q6031		
E	0	0
C	0	0
B	4.6	4.6
Q6032		
E	0	0
C	0	0
B	4.1	4.1

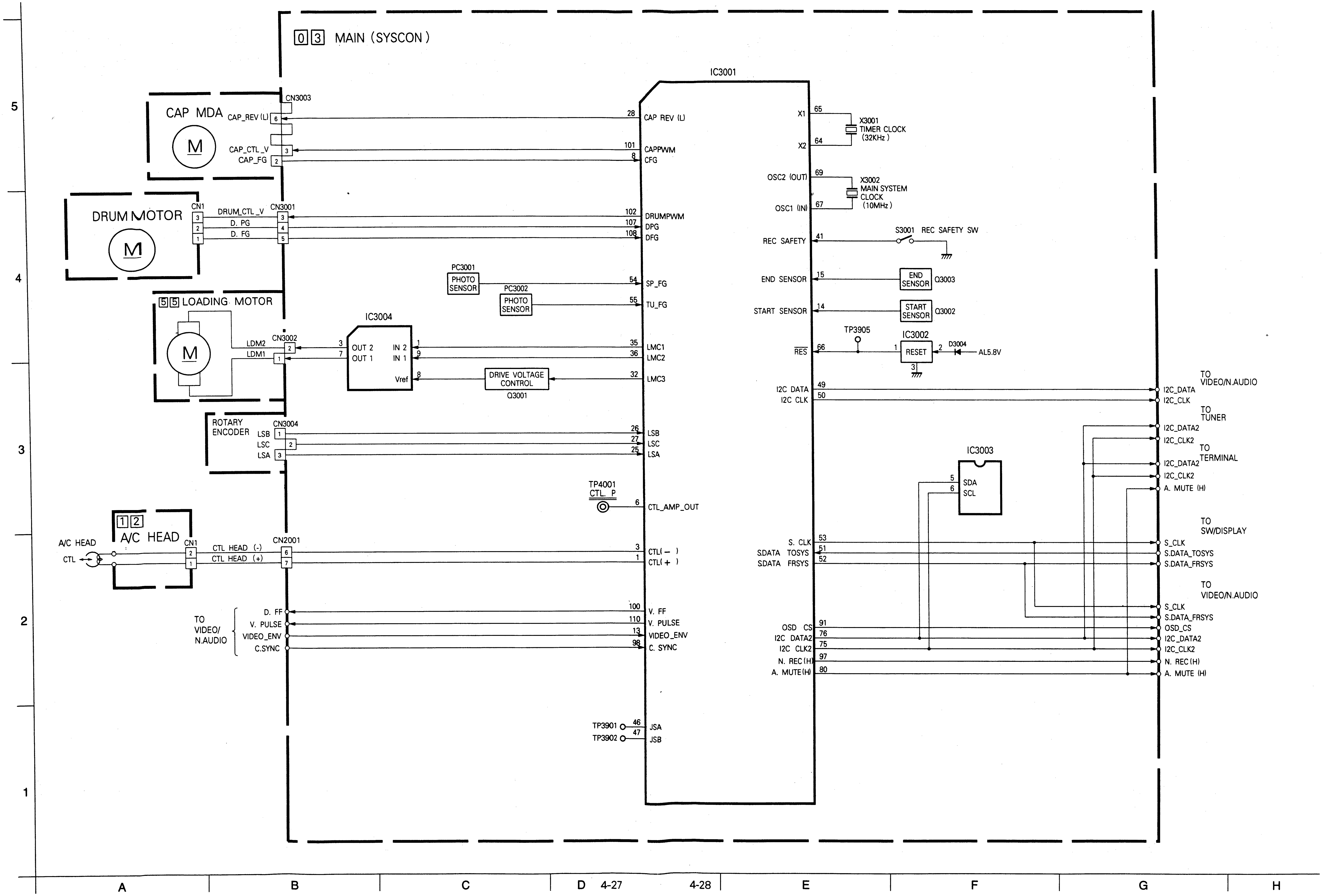
<TERMINAL>

MODE PIN NO.	REC	PLAY
IC7151		
1	1.6	1.6
2	0	0
3	1.6	1.6
4	11.7	11.7
5	2.0	2.0
6	0	0
7	5.2	5.2
8	11.7	11.7
9	5.2	5.2
10	0	0
11	5.2	5.2
12	0	0
13	5.0	5.0
14	5.0	5.0
15	5.9	5.9
16	5.2	5.2
17	5.9	5.9
18	5.2	5.2
19	11.8	11.8
20	2.5	2.5
21	1.4	1.1
22	1.4	1.1
23	2.6	2.6
24	2.0	2.0
Q7152		
E	3.0	3.0
C	0	0
B	2.3	2.3
Q7153		
E	5.2	5.2
C	-0.1	-0.1
B	5.1	5.1
Q7154		
E	0	0
C	5.1	5.1
B	0	0
Q7155		
E	0	0
C	0	0
B	0	0
Q7156		
E	0	0
C	0	0
B	0	0

<SW/DISPLAY>

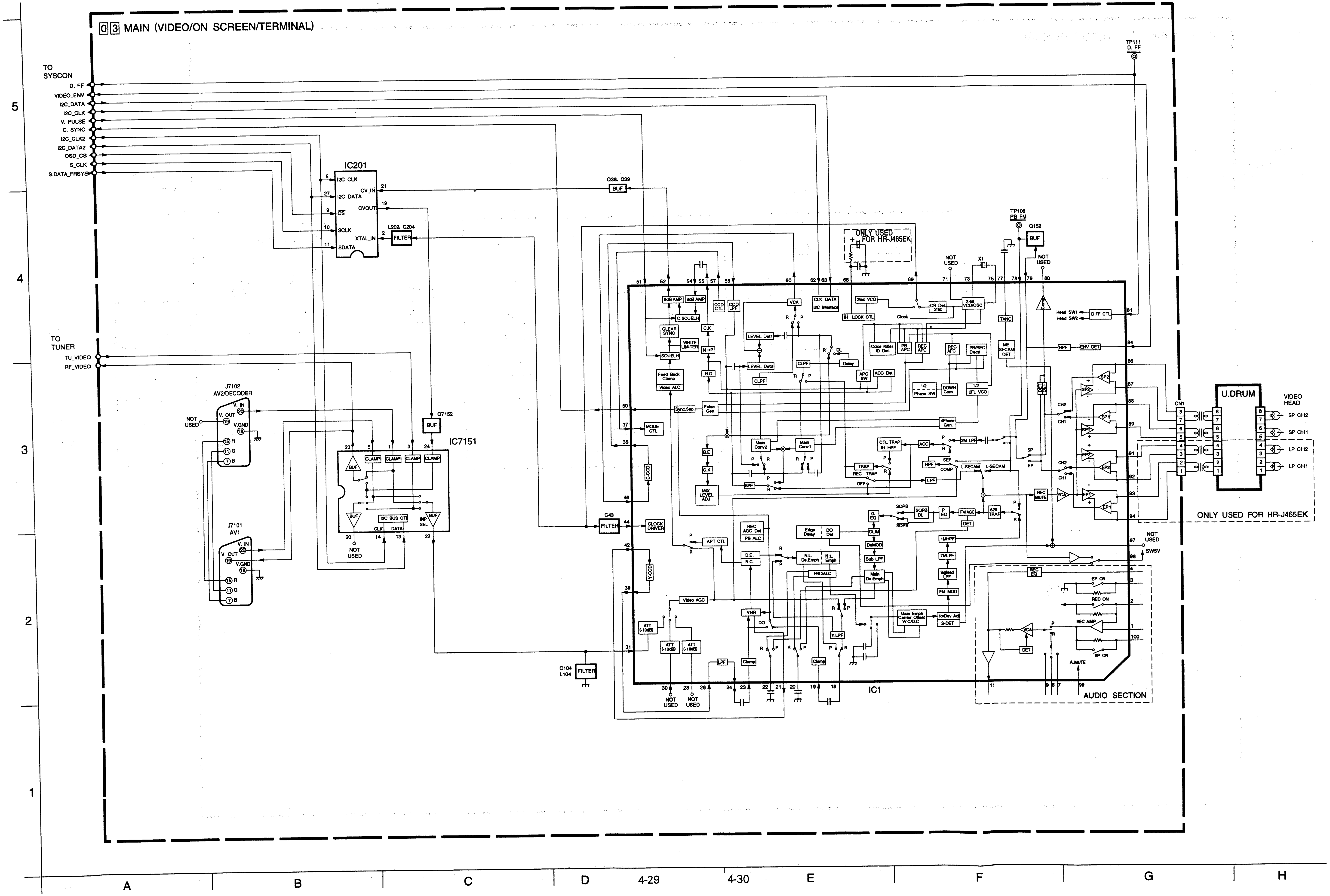
MODE PIN NO.	REC	PLAY
IC7001		
1	5.2	5.2
2	2.2	2.2
3	0	0
4	2.2	2.2
5	5.2	5.2
6	5.1	5.1
7	4.1	4.1
8	5.1	5.1
9	5.1	5.1
10	5.1	5.1
11	5.1	5.1
12	4.9	4.9
13	3.6	0.8
14	5.1	5.1
15	4.7	4.7
16	-29.6	-29.6
17	-29.6	-29.6
18	-29.4	-29.4
19	-29.4	-29.4
20	-29.4	-29.4
21	-25.0	-25.0
22	-	-
23	-	-
24	-	-
25	-	-
26	-	-
27	-	-
28	-	-
29	-	-
30	-	-
31	-	-
32	-	-
33	-	-
34	-	-
35	-	-
36	-	-
37	-	-
38	-	-
39	-	-
40	-	-
41	-	-
42	-	-
43	-	-
44	5.2	5.2
IC7002		
1	5.1	5.1
2	5.1	5.1
3	0	0
CN7002		
1	-0.2	-0.2
2	0	0
3	-0.2	-0.2

4.13 SYSTEM CONTROL BLOCK DIAGRAM

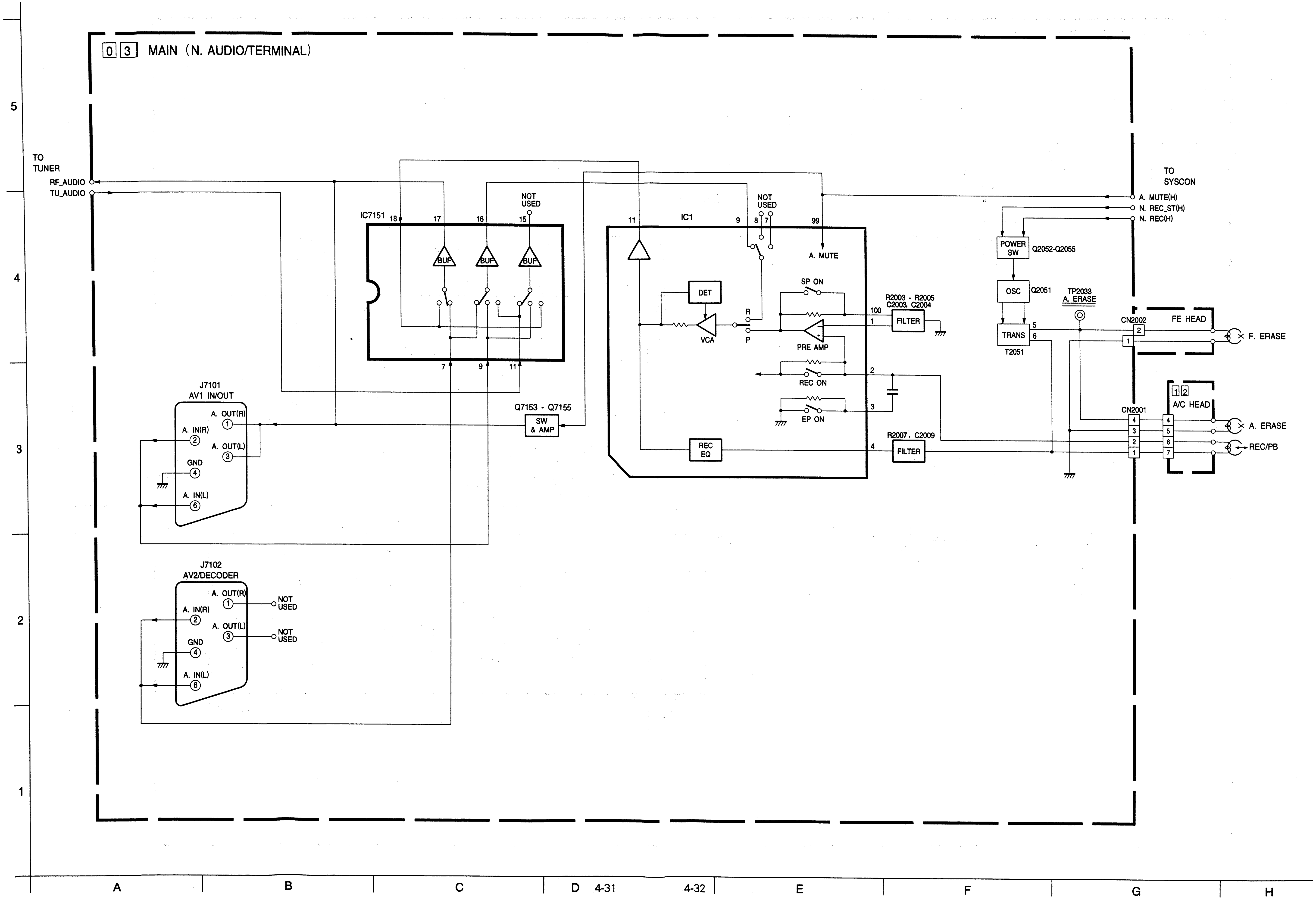


03 MAIN (SYSCON)
IC3001
CAP MDA
M
CAP_REV (L)
CAP_CTL_V
CAP_FG
CN3003
6
3
2
28 CAP REV (L)
101 CAPPWM
8 CFG
DRUM MOTOR
M
CN1
DRUM_CTL_V
D. PG
D. FG
CN3001
102 DRUMPWM
107 DPG
108 DFG
PC3001
PHOTO SENSOR
PC3002
PHOTO SENSOR
54 SP_FG
55 TU_FG
55 LOADING MOTOR
M
LDM2
LDM1
CN3002
IC3004
OUT 2
OUT 1
IN 2
IN 1
Vref
DRIVE VOLTAGE CONTROL
Q3001
35 LMC1
36 LMC2
32 LMC3
ROTARY ENCODER
CN3004
LSB
LSC
LSA
26 LSB
27 LSC
25 LSA
TP4001
CTL. P
6 CTL_AMP_OUT
12 A/C HEAD
A/C HEAD
CTL
CN1
CN2001
CTL HEAD (-)
CTL HEAD (+)
3 CTL(-)
1 CTL(+)
TO VIDEO/ N.AUDIO
D. FF
V. PULSE
VIDEO_ENV
C.SYNC
100 V. FF
110 V. PULSE
13 VIDEO_ENV
98 C. SYNC
TP3901
TP3902
46 JSA
47 JSB
X1 65
X2 64
X3001
TIMER CLOCK
(32KHz)
OSC2 (OUT) 69
OSC1 (IN) 67
X3002
MAIN SYSTEM CLOCK
(10MHz)
REC SAFETY 41
S3001 REC SAFETY SW
END SENSOR 15
END SENSOR
Q3003
START SENSOR 14
START SENSOR
Q3002
TP3905
IC3002
RES 66
RESET
D3004
AL5.8V
I2C DATA 49
I2C CLK 50
TO VIDEO/N.AUDIO
I2C_DATA
I2C_CLK
TO TUNER
I2C_DATA2
I2C_CLK2
TO TERMINAL
I2C_DATA2
I2C_CLK2
A. MUTE (H)
IC3003
SDA
SCL
TO SW/DISPLAY
S. CLK 53
SDATA TOSYS 51
SDATA FRSYS 52
S_CLK
S.DATA_TOSYS
S.DATA_FRSYS
TO VIDEO/N.AUDIO
S_CLK
S.DATA_FRSYS
OSD_CS
I2C_DATA2
I2C_CLK2
N. REC (H)
A. MUTE (H)
OSD CS 91
I2C DATA2 76
I2C CLK2 75
N. REC (H) 97
A. MUTE (H) 80
A
B
C
D
E
F
G
H
1
2
3
4
5

4.14 VIDEO BLOCK DIAGRAM


03 MAIN (VIDEO/ON SCREEN/TERMINAL)
TO SYSCON
D. FF
VIDEO_ENV
I2C_DATA
I2C_CLK
V. PULSE
C. SYNC
I2C_CLK2
I2C_DATA2
OSD_CS
S_CLK
S.DATA_FRSYS
IC201
I2C CLK
I2C DATA
CS
SCLK
SDATA
CV_IN
CVOUT
XTAL_IN
L202, C204
FILTER
Q38, Q39
BUF
TO TUNER
TU_VIDEO
RF_VIDEO
J7102
AV2/DECODER
V. IN
V. OUT
V.GND
R
G
B
NOT USED
J7101
AV1
Q7152
BUF
IC7151
CLAMP
I2C BUS CTL
CLK
DATA
INP SEL
NOT USED
C43
FILTER
C104
L104
FILTER
CLOCK DRIVER
MODE CTL
C-CCD
Y-CCD
ATT (-10dB)
APT CTL
Video AGC
YNR
LPF
Clamp
IC1
NOT USED
ONLY USED FOR HR-J465EK
TP106
PB FM
Q152
BUF
X1
TP111
D. FF
6dB AMP
C.SOUELH
CLEAR SYNC
WHITE LIMITER
SOUELH
Feed Back Clamp
Video ALC
Sync Sep.
Pulse Gen.
CCD CTL
CCD LPF
C.K
N→P
B.D
VCA
LEVEL Det1
LEVEL Det2
CLPF
Delay
CLK DATA
I2C Interface
2fsc VCO
1H LOCK CTL
Clock
CR Det 2fsc
X-tal VCO/OSC
Color Killer ID Det.
PB APC
REC APC
REC AFC
PB/REC Discri
APC SW
ACC Det
1/2 Phase SW
DOWN Conv.
1/2 2FL VCO
4Phase Gen.
TANC
ME SECAM DET
Main Conv2
Main Conv1
B.E
MIX LEVEL ADJ
BPF
TRAP
REC TRAP
OFF
CTL TRAP 1H HPF
ACC
2M LPF
HPF
SEP.
COMP
L-SECAM
LPF
REC MUTE
VCA
Head SW1
Head SW2
D.FF CTL
HPF
ENV DET
CH2
CH1
SP
EP
SP2
SP1
EP2
EP1
REC AGC Det
PB ALC
Edge Delay
DO Det
D.E. N.C.
N.L. De.Emph
N.L. Emph
FBC/ALC
Main De.Emph
Y.LPF
G EQ
SQPB DL
P EQ
FM AGC
629 TRAP
DET
DLIM
DeMOD
Sub LPF
1MHPF
7MLPF
Isolated LPF
FM MOD
Main Emph Carrier Offset W.C/D.C
Io/Dev Adj
S-DET
SW5V
REC EQ
EP ON
REC ON
REC AMP
SP ON
A.MUTE
AUDIO SECTION
CN1
U.DRUM
VIDEO HEAD
SP CH2
SP CH1
LP CH2
LP CH1
ONLY USED FOR HR-J465EK
5
4
3
2
1
A
B
C
D
E
F
G
H

4.15 AUDIO BLOCK DIAGRAM



0 3 MAIN (N. AUDIO/TERMINAL)
TO TUNER
RF_AUDIO
TU_AUDIO
IC7151
18
17
16
15
NOT USED
BUF
BUF
BUF
7
9
11
IC1
11
9
8
7
99
NOT USED
A. MUTE
DET
VCA
R
P
SP ON
PRE AMP
REC ON
EP ON
REC EQ
100
1
2
3
4
R2003 - R2005
C2003, C2004
FILTER
R2007 , C2009
FILTER
J7101
AV1 IN/OUT
A. OUT(R)
①
A. IN(R)
②
A. OUT(L)
③
GND
④
A. IN(L)
⑥
Q7153 - Q7155
SW & AMP
J7102
AV2/DECODER
A. OUT(R)
①
NOT USED
A. IN(R)
②
A. OUT(L)
③
NOT USED
GND
④
A. IN(L)
⑥
TO SYSCON
A. MUTE(H)
N. REC_ST(H)
N. REC(H)
POWER SW
Q2052-Q2055
OSC
Q2051
TRANS
T2051
5
6
TP2033
A. ERASE
CN2002
2
1
FE HEAD
F. ERASE
1 2
A/C HEAD
CN2001
4
3
2
1
4
5
6
7
A. ERASE
REC/PB
5
4
3
2
1
A
B
C
D
E
F
G
H

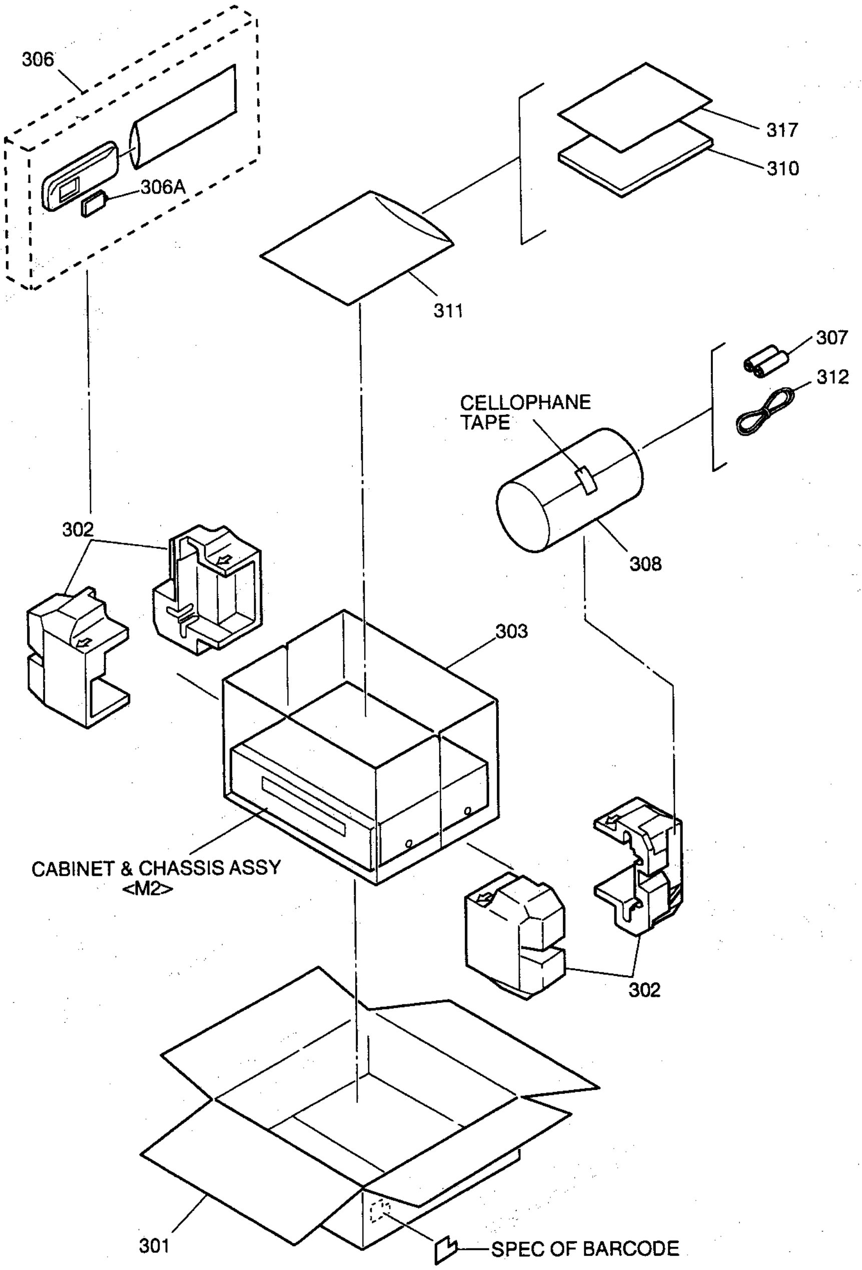
SECTION 5
PARTS LIST

SAFETY PRECAUTION

Parts identified by the ⚠ symbol are critical for safety. Replace only with specified part numbers.

5.1 PACKING AND ACCESSORY ASSEMBLY <M1>

The instruction manual to be provided with this product will differ according to the destination.


306
306A
317
310
311
307
312
CELLOPHANE TAPE
308
302
303
CABINET & CHASSIS ASSY <M2>
302
301
SPEC OF BARCODE

* *

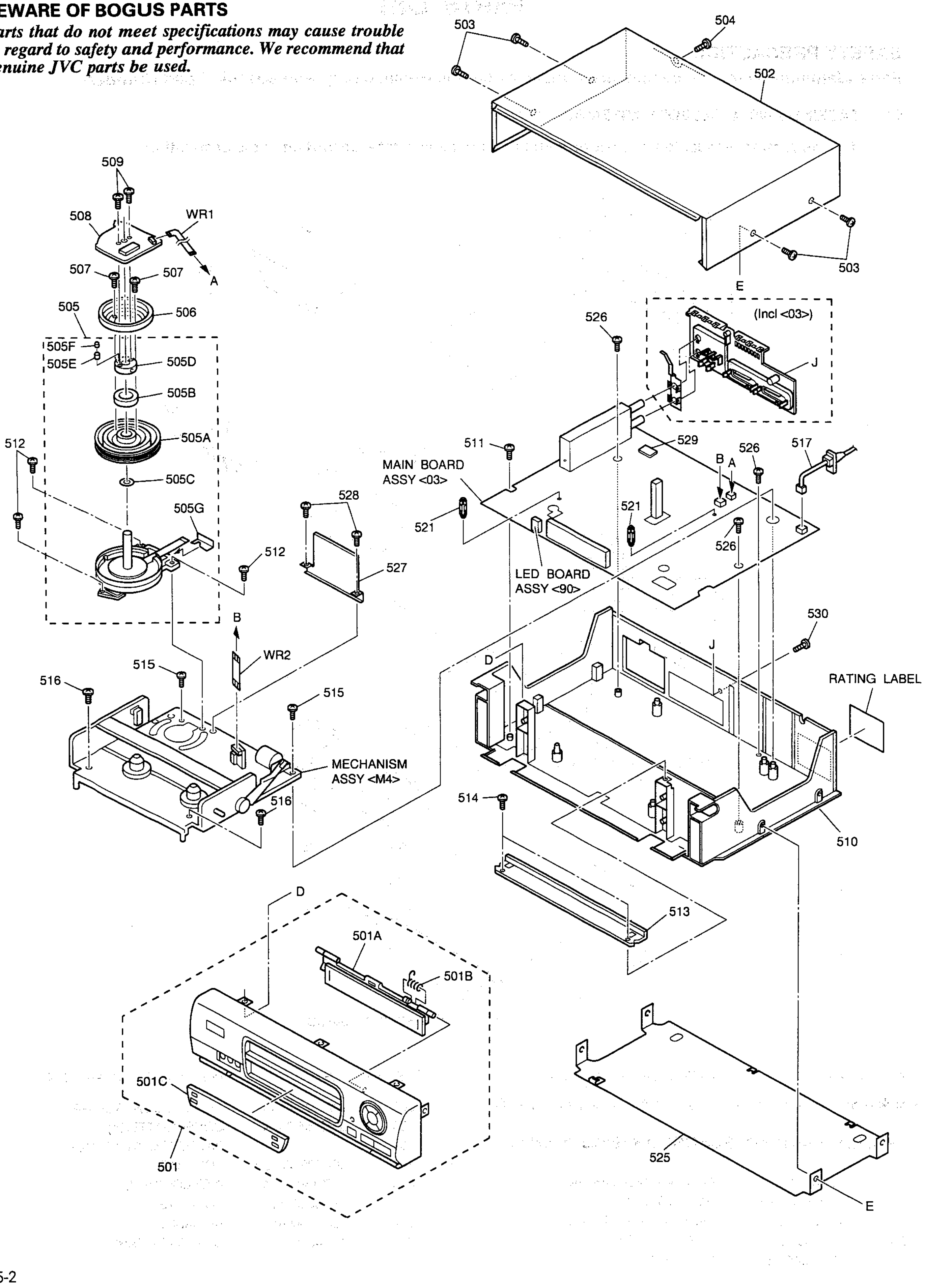
PACKING AND ACCESSORY ASSEMBLY <M1>

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION
		301	LP30537-007A	PACKING CASE,J465EK
			LP30537-009A	PACKING CASE,J265EK
			LP30537-021A	PACKING CASE,J260EK
		302	LP30355-001D	CUSHION ASSY
		303	PQM30021-93	POLY BAG
		306	LP20337-013A	REMOTE CONTROLLER
		306A	LP40254-004A	COVER(BATTERY)
		307	–	BATTERY,X2("AA" TYPE)
		308	QPC02202215P	POLY BAG
	⚠	310	LPT0180-001A	INST.BOOK(EN)
		311	QPC02503515P	POLY BAG
		312	PEAC0300-02	RF CABLE
		317	BT-54008-2	GUARANTY CARD

5.2 CABINET AND CHASSIS ASSEMBLY <M2>

BEWARE OF BOGUS PARTS

Parts that do not meet specifications may cause trouble in regard to safety and performance. We recommend that genuine JVC parts be used.



503
504
502
503
E
509
508
WR1
507
507
A
505
506
505F
505E
505D
505B
505A
505C
505G
512
512
528
527
526
(Incl <03>)
J
511
529
526
517
MAIN BOARD ASSY <03>
B
A
521
521
526
LED BOARD ASSY <90>
530
B
WR2
J
D
RATING LABEL
515
516
515
MECHANISM ASSY <M4>
516
514
510
D
513
501A
501B
501C
501
525
E

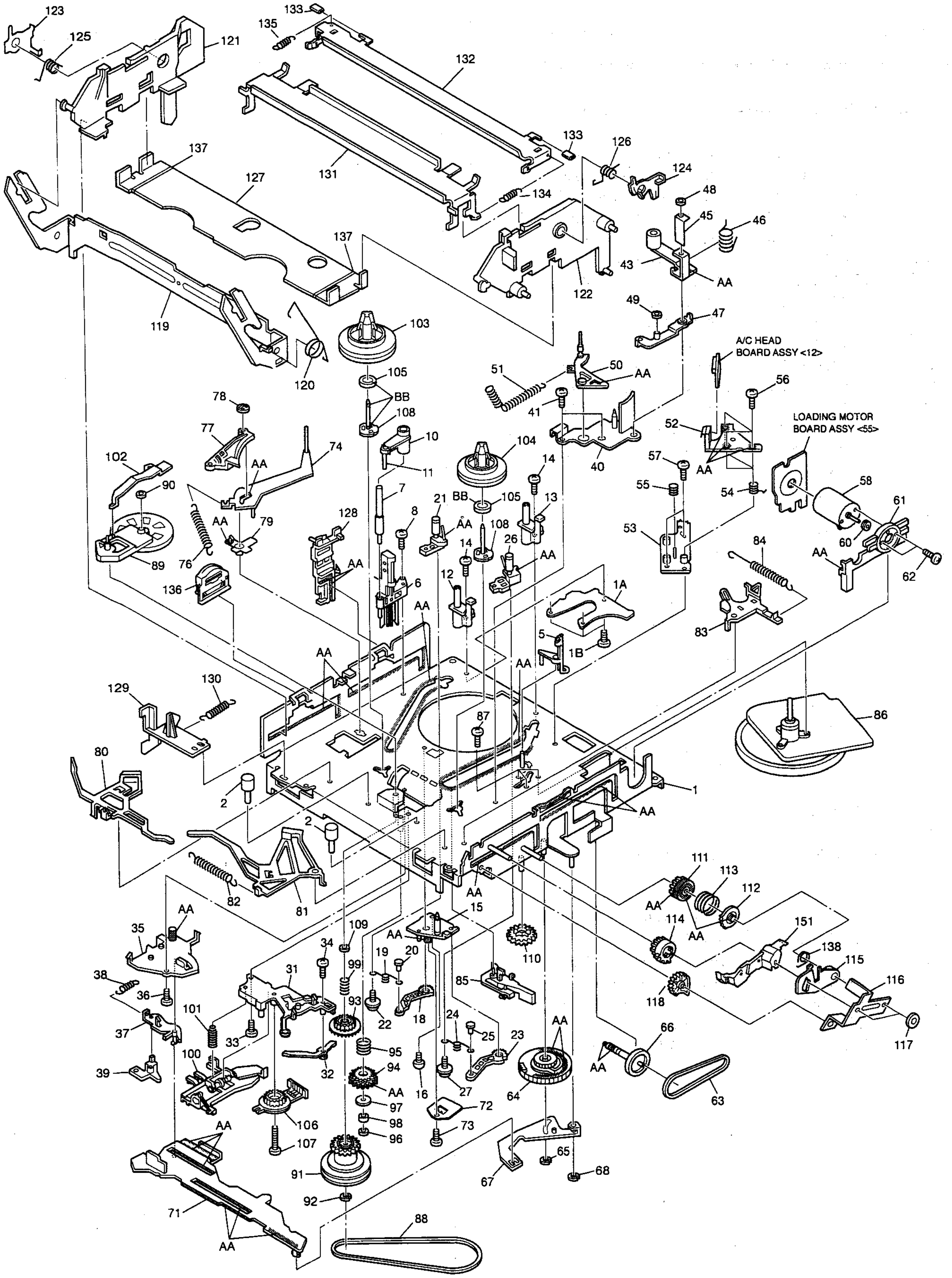
****

CABINET AND CHASSIS ASSEMBLY <M2>

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION
	⚠	501	LP10212-005B	FRONT PANEL ASSY,J465EK
			LP10212-006B	FRONT PANEL ASSY,J265EK
			LP10212-016B	FRONT PANEL ASSY,J260EK
		501A	PQ21884-57-23	CASSETTE DOOR,J265EK/J465EK
			PQ21884-69-23	CASSETTE DOOR,J260EK
		501B	PQ46448	TORSION SPRING
		501C	LP20326-037A	DISPLAY WINDOW,J465EK
			LP20326-038A	DISPLAY WINDOW,J265EK
			LP20326-048A	DISPLAY WINDOW,J260EK
	⚠	502	LP10013-023B	TOP COVER
		503	QYTDSF3010M	SCREW,X4 TOP COVER(SIDE)
		504	QYTDSF3010M	SCREW,TOP COVER(REAR)
		505	LP20617-004A	DRUM SUB ASSY,J465EK
			LP20617-005A	DRUM SUB ASSY,J260EK/J265EK
		505A	LP20084-006A	UPPER DRUM ASSY,J465EK
			LP20084-003A	UPPER DRUM ASSY,J260EK/265EK
		505B	PDM4439	CAP
		505C	PDM4444-19-2	WASHER
		505D	LP40028-002A	COLLAR ASSY
		505E	LP40323-001A	CONTACT
		505F	LP30004-005A	COMPRESSION SPRING
		505G	LP40174-001B	FPC PLATE
		506	PDZ0179-1-4	ROTOR ASSY
		507	QYSPSP3006Z	SCREW,X2
		508	PDZ0180-1-2	STATOR ASSY
		509	QYSPSPL2607Z	SCREW,X2
	⚠	510	LP10108-001B	BOTTOM CHASSIS
		511	QYTDSF3010Z	SCREW,MAIN
		512	QYSDST2610Z	SCREW,X3 DRUM
		513	LP30312-001B	BRACKET(CHASSIS)
		514	QYTDSF3010Z	SCREW,X2 BRACKET(CHASSIS)
		515	QYTDSF4012Z	SCREW,X2 MECHA
		516	QYTDSF3010Z	SCREW,X2 MECHA
	⚠	517	QMP51K0-170	POWER CORD
		521	LP40226-001A	PC SUPPORT,X2
	⚠	525	LP10014-002B	BOTTOM COVER
		526	DPSF3010Z	SCREW,X3 MAIN
		527	LP30356-001B	DRUM SHIELD
		528	QYTDST2606Z	SCREW,X2 DRUM SHIELD
		529	LP30002-042A	SPACER,MAIN BOARD
		530	QYTDSF3010M	SCREW,TERMINAL BOARD
		WR1	QUQ212-0518CG	FFC WIRE,DRUM CN3001
		WR2	WJT0005-002A	E-CARD WIRE,A/C HEAD CN2001

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION

.3 MECHANISM ASSEMBLY <M4>


123
133
125
121
135
132
137
127
131
133
126
124
48
134
45
46
137
43
AA
122
119
49
47
103
A/C HEAD
BOARD ASSY <12>
120
105
BB
51
50
AA
108
78
41
56
77
10
52
LOADING MOTOR
BOARD ASSY <55>
74
104
AA
11
40
102
AA
14
57
90
7
21
BB
105
13
55
58
54
128
8
AA
AA
108
61
79
14
26
53
84
76
89
AA
60
AA
AA
6
12
62
136
1A
AA
5
83
AA
1B
AA
129
130
87
86
80
1
2
AA
2
111
AA
82
81
113
AA
15
112
35
109
AA
114
151
34
19
20
AA
AA
138
31
99
110
115
38
85
36
116
93
101
118
22
18
24
25
37
33
95
23
66
AA
100
94
AA
117
39
32
AA
16
27
64
63
97
72
106
98
AA
96
73
107
65
91
67
68
92
71
88
AA

Classifi-cation	Part No.	Symbol in drawing
Grease	KYODO-SH-P	AA
Oil	COSMO-HV56	BB

NOTE: The section marked in AA and BB indicate lubrication and greasing areas.

****

MECHANISM ASSEMBLY <M4>

# ⚠ REF No.	PART No.	PART NAME, DESCRIPTION
1	LP20228-008F	MAIN DECK ASSY
1A	LP40275-002A	PLATE(SUPPLY)
1B	QYTDST2606Z	SCREW,X3 PLATE(SUPPLY)
2	PQ46302-1-3	ADJUST PIN,X2
5	LP30492-002A	GUIDE POLE GUARD
6	NAH0001-001	FULL ERASE HEAD
7	LP40098-001B	GUIDE POLE(SUPPLY)
8	QYTDST2608Z	SCREW,FE HEAD
10	LP30459-001A	TENSION STUD BASE
11	LP40367-002A	TENSION STUD
12	LP40096-001B	UV CATCHER(SUPPLY)
13	LP40536-001A	UV CATCHER ASSY(TAKE UP)
14	QYTPST2606Z	SCREW,X2 UV CATCHER
15	LP30223-003C	LOADING ARM GEAR SHAFT
16	QYTDST2606Z	SCREW
18	LP30224-001A	LOADING ARM GEAR(SPPLY)
19	LP40099-001A	TORSION ARM
20	LP40100-001A	PIN
21	LP40101-002A	POLE BASE ASSY(SUPPLY)
22	QYSPSTG2606Z	SCREW
23	LP40103-002A	LOADING ARM GEAR(TAKE UP)
24	LP40523-001A	TORSION ARM
25	LP40100-001A	PIN
26	LP40104-002A	POLE BASE ASSY(TAKE UP)
27	QYSPSTG2606Z	SCREW
31	LP20233-003H	ROTARY ENCODER GUIDE
32	LP30499-001A	BRAKE LEVER
33	QYTPST2606Z	SCREW
34	QYTPST2608Z	SCREW
35	LP30226-004B	CONTROL PLATE GUIDE
36	QYTPST2605Z	SCREW
37	LP30249-003B	TAKE UP LEVER
38	LP30003-006A	TENSION SPRING
39	LP40119-002A	T.UP HEAD
40	LP20234-004B	LID GUIDE
41	QYTDST2606Z	SCREW,X2
43	LP40105-001B	PINCH ROLLER ARM ASSY
45	LP40478-001A	PINCH ROLLER SHEET2
46	LP40148-002A	TORSION SPRING
47	LP40149-001B	P.LEVER ASSY
48	LP30016-002A	SLIT WASHER
49	LP40404-001A	SPACER,P.LEVER ASSY
50	LP40106-001G	GUIDE ARM ASSY
51	LP40134-001B	TENSION SPRING
52	QAH0010-004	AC HEAD
53	LP30228-001A	HEAD BASE
54	LP30004-013A	COMPRESSION SPRING,X3
55	LP40236-001A	COMPRESSION SPRING
56	LP40213-002B	SPECIAL SCREW,X3
57	QYTDST2608Z	SCREW,X2
58	QAR0023-001	LOADING MOTOR
60	PQ43546-1-2	MOTOR PULLEY
61	LP30230-003A	MOTOR GUIDE
62	QYTPSP3003Z	SCREW,X2
63	LP30005-003A	BELT,LOADING MOTOR
64	LP30229-001F	CONTROL CAM
65	PQM30017-24	SLIT WASHER
66	LP40120-001A	WORM GEAR
67	LP40107-002A	LINK LEVER ASSY
68	PQM30017-24	SLIT WASHER
71	LP10201-001A	CONTROL PLATE
72	LP40379-001A	CTL BRACKET(1)
73	QYTDSF2608M	SCREW
74	LP40108-002A	TENSION ARM ASSY
76	LP30003-010A	TENSION SPRING
77	LP40109-002D	TENSION BRAKE ASSY
78	PQ46302-1-3	ADJUST PIN
79	LP30232-002A	T.ARM BEARING
80	LP40532-001A	MAIN BRAKE ASSY (SUPPLY)
81	LP40111-003A	MAIN BRAKE ASSY (TAKE-UP)
82	LP30003-002A	TENSION SPRING
83	LP40112-001E	SUB BRAKE ASSY(TAKE UP)
84	LP40357-002A	TENSION SPRING
85	LP40461-001A	CAPSTAN BRAKE ASSY
86	QAR0087-002	CAPSTAN MOTOR
87	QYTDSF2608M	SCREW,X3
88	LP30005-007A	BELT,CAPSTAN MOTOR
89	LP40114-006B	IDLER ARM ASSY
90	LP30016-001A	SLIT WASHER
91	LP40459-003B	CLUTCH UNIT
92	PQM30017-47	SLIT WASHER
93	LP40446-002A	CLUTCH GEAR 1
94	LP40442-001A	DIRECT GEAR
95	LP40483-002A	COMPRESSION SPRING
96	LP30016-001A	SLIT WASHER
97	LP30017-014A	SPACER,D.GEAR
98	QYWFM264713	WASHER,D.GEAR
99	LP40554-001A	COMPRESSION SPRING,C.GEAR1
100	LP40484-001E	CHANGE LEVER ASSY
101	LP40512-003A	COMPRESSION SPRING
102	LP30236-002B	IDLER LEVER
103	LP40420-001A	REEL DISK (SUPPLY)
104	LP40421-001A	REEL DISK (TAKE-UP)
105	LP30017-015A	SPACER,X2
106	QSW0554-003	ROTARY ENCODER
107	QYTPST2620Z	SCREW
108	LP40123-001A	REEL SHAFT,X2
109	LP30017-019A	SPACER,C.GEAR 1
110	LP30237-002B	CASSETTE GEAR
111	LP30239-002F	LIMIT GEAR(1)
112	LP30240-002E	LIMIT GEAR(2)
113	LP40136-001E	TORSION SPRING
114	LP30242-001A	RELAY GEAR
115	LP30339-002D	OPENER GUIDE
116	LP40214-001A	C.H.BRACKET
117	PQM30017-47	SLIT WASHER,X2
118	LP30243-001C	DRIVE GEAR
119	LP20240-001C	DRIVE ARM
120	LP40137-001A	TORSION SPRING
121	LP10081-001G	SIDE HOLDER(L)
122	LP10082-002K	SIDE HOLDER(R)
123	LP30255-003C	LOCK LEVER(L)
124	LP30256-001E	LOCK LEVER(R)
125	LP40168-001A	TORSION SPRING(L)
126	LP40218-001B	TORSION SPRING(R)
127	LP30257-001E	CASSETTE HOLDER
128	LP30244-001F	GUIDE RAIL
129	LP30245-001C	REC SAFETY LEVER
130	LP30003-004A	TENSION SPRING
131	LP20578-001B	TOP GUIDE
132	LP30500-001C	HOLD PLATE
133	LP40450-002A	PAD,X2 HOLD PLATE
134	LP30003-025B	TENSION SPRING
135	LP30003-024A	TENSION SPRING
136	LP40481-001A	ROLLER CAM ASSY
137	LP30019-014A	PAD,X2 CASSETTE HOLDER
138	LP40545-001A	TORSION SPRING,OPENER GUIDE
151	LP20324-002E	DOOR OPENER

5.4 ELECTRICAL PARTS LIST

* *

MAIN BOARD ASSEMBLY <03>

REF No.	PART No.	PART NAME, DESCRIPTION
PW1	LPA10045-04C1	MAIN BOARD ASSY,J465EK
	LPA10045-03C1	MAIN BOARD ASSY,J260EK/J265EK
IC1	JCP8017-MSA	IC
IC201	LC74775-9615	IC
IC3001	HD6432194A01F	IC
IC3002	S-80728AN-DR-X	IC
	or S-80828ANUP-W	IC
IC3003	M24C08-BN6	IC
	or 24LC08B/P	IC
	or AT24C08-10PC	IC
IC3004	TA7291S	IC
IC5301	LA5613	IC
IC6080	BA15218F-XE	IC
IC7001	M35500BGP	IC
	or M35500AGP	IC
IC7002	GP1U291Q	IR DETECT UNIT
	or PNA4652M00YC	IR DETECT UNIT
IC7151	BH7635S	IC
Q38	2SD1819A/QRS/-X	TRANSISTOR
	or 2PC4081/R/-X	TRANSISTOR
	or 2SC4081/QRS/-X	TRANSISTOR
Q39	2SB1218A/QR/-X	TRANSISTOR
	or 2SA1576A/QR/-X	TRANSISTOR
	or 2PA1576/R/-X	TRANSISTOR
Q152	2SB1218A/QR/-X	TRANSISTOR
	or 2PA1576/R/-X	TRANSISTOR
	or 2SA1576A/QR/-X	TRANSISTOR
Q2001	2SC4081/QRS/-X	TRANSISTOR
	or 2PC4081/R/-X	TRANSISTOR
	or 2SD1819A/QRS/-X	TRANSISTOR
Q2002	2SC4081/QRS/-X	TRANSISTOR
	or 2SD1819A/QRS/-X	TRANSISTOR
	or 2PC4081/R/-X	TRANSISTOR
Q2003	UN511E	TRANSISTOR
	or DTA144WU	TRANSISTOR
	or RN2309	TRANSISTOR
Q2051	2SC4081/QRS/-X	TRANSISTOR
	or 2SD1819A/QRS/-X	TRANSISTOR
	or 2PC4081/R/-X	TRANSISTOR
Q2052	2SA1576A/QR/-X	TRANSISTOR
	or 2PA1576/R/-X	TRANSISTOR
	or 2SB1218A/QR/-X	TRANSISTOR
Q2053	UN521E	TRANSISTOR
	or RN1309	TRANSISTOR
	or DTC144WU	TRANSISTOR
Q2054	2SA1576A/QR/-X	TRANSISTOR
	or 2PA1576/R/-X	TRANSISTOR
	or 2SB1218A/QR/-X	TRANSISTOR
Q2055	UN521E	TRANSISTOR
	or RN1309	TRANSISTOR
	or DTC144WU	TRANSISTOR
Q3001	2SD1819A/QRS/-X	TRANSISTOR
	or 2PC4081/R/-X	TRANSISTOR
	or 2SC4081/QRS/-X	TRANSISTOR
Q3002	PTZ-NV16	PHOTO TRANSISTOR
	or PTZ-NV16A	PHOTO TRANSISTOR
Q3003	PTZ-NV16	PHOTO TRANSISTOR

#	⚠ REF No.	PART No.	PART NAME, DESCRIPTION
		or PTZ-NV16A	PHOTO TRANSISTOR
	Q3004	2SD1819A/QRS/-X	TRANSISTOR
		or 2SC4081/QRS/-X	TRANSISTOR
		or 2PC4081/R/-X	TRANSISTOR
	Q3005	2SD1819A/QRS/-X	TRANSISTOR
		or 2PC4081/R/-X	TRANSISTOR
		or 2SC4081/QRS/-X	TRANSISTOR
	Q4001	UN5211	TRANSISTOR
		or DTC114EU	TRANSISTOR
		or RN1302	TRANSISTOR
	Q5101	2SK2632-CB14	POWER MOS FET
		or 2SK2129-LT	POWER MOS FET
		or 2SK2632	POWER MOS FET
		or 2SK2129	POWER MOS FET
	Q5102	2SD2144S/UV/-T	TRANSISTOR
	Q5303	2SD2144S/UVW/-T	TRANSISTOR
	Q5304	2SD1450/ST/-T	TRANSISTOR
		or 2SD1302/ST/-T	TRANSISTOR
	Q6030	2SB1218A/RS/-X	TRANSISTOR
	Q6031	UN5211	TRANSISTOR
		or RN1302	TRANSISTOR
		or DTC114EU	TRANSISTOR
	Q6032	UN5211	TRANSISTOR
		or DTC114EU	TRANSISTOR
		or RN1302	TRANSISTOR
	Q7152	2SB1218A/QR/-X	TRANSISTOR
		or 2PA1576/R/-X	TRANSISTOR
		or 2SA1576A/QR/-X	TRANSISTOR
	Q7153	UN511E	TRANSISTOR
		or RN2309	TRANSISTOR
		or DTA144WU	TRANSISTOR
	Q7154	UN521E	TRANSISTOR
		or DTC144WU	TRANSISTOR
		or RN1309	TRANSISTOR
	Q7155	2SD1819A/QRS/-X	TRANSISTOR
		or 2SC4081/QRS/-X	TRANSISTOR
		or 2PC4081/R/-X	TRANSISTOR
	Q7156	2SD1819A/QRS/-X	TRANSISTOR
		or 2PC4081/R/-X	TRANSISTOR
		or 2SC4081/QRS/-X	TRANSISTOR
	D2001	1SS133	DIODE
	D3001	LNB2301L01VI	LE DIODE
	D3002	1SS133	DIODE
	D3003	RD39ES/B3/-T2	ZENER DIODE
		or MTZJ39C	ZENER DIODE
	D3004	11ES2	DIODE
	D3005	11ES2	DIODE
	D4001	1SS133	DIODE
	D4002	1SS133	DIODE
	D5001	S1WB(A)60F4102	BRIDGE DIODE
		or S1WB(A)60F4072X	BRIDGE DIODE
		or S1WB(A)60F4062X	BRIDGE DIODE
	D5101	AU01	FR DIODE
		or ERA18-04-T2	FR DIODE
		or PG104RS	FR DIODE
		or 10ELS4	FR DIODE
		or 1SR153-400-T2	FR DIODE
	D5102	AU01	FR DIODE
		or ERA18-04-T2	FR DIODE
		or PG104RS	FR DIODE
		or 1SR153-400-T2	FR DIODE

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
			or 10ELS4	FR DIODE	
		D5103	1SS133	DIODE	
		D5201	AU01Z	FR DIODE	
			or 10ELS2	FR DIODE	
		D5203	AU01Z	FR DIODE	
			or PG104RS	FR DIODE	
			or 1SR153-400-T2	FR DIODE	
			or ERA18-02-T2	FR DIODE	
			or 10ELS2	FR DIODE	
		D5204	AU01Z	FR DIODE	
			or ERA18-02-T2	FR DIODE	
			or 1SR153-400-T2	FR DIODE	
			or 10ELS2	FR DIODE	
			or PG104RS	FR DIODE	
		D5205	AU01Z	FR DIODE	
			or ERA18-02-T2	FR DIODE	
			or PG104RS	FR DIODE	
			or 1SR153-400-T2	FR DIODE	
			or 10ELS2	FR DIODE	
		D5207	AK04	DIODE	
			or 11EQS04	SB DIODE	
		D5210	AU01Z	FR DIODE	
			or ERA18-02-T2	FR DIODE	
			or 1SR153-400-T2	FR DIODE	
			or 10ELS2	FR DIODE	
			or PG104RS	FR DIODE	
		D5211	AU01Z	FR DIODE	
			or ERA18-02-T2	FR DIODE	
			or 1SR153-400-T2	FR DIODE	
			or PG104RS	FR DIODE	
			or 10ELS2	FR DIODE	
		D5301	MTZJ15A	ZENER DIODE	
			or RD15ES/B1/-T2	ZENER DIODE	
		D5302	MTZJ6.8A	ZENER DIODE	
			or RD6.8ES/B1/-T2	ZENER DIODE	
		D5303	MTZJ30A	ZENER DIODE	
			or RD30ES/B1/-T2	ZENER DIODE	
		D5304	1SS133	DIODE	
		D5311	RD5.1ES/B3/-T2	ZENER DIODE	
			or MTZJ5.1C	ZENER DIODE	
		D6002	HZ30-2L-T2	ZENER DIODE	
			or HZ30-2LTD	Z DIODE (M)	
		D7002	RD9.1ES/B2/-T2	ZENER DIODE	
			or MTZJ9.1B	ZENER DIODE	
		D7008	1SS133	DIODE	
		D7009	1SS133	DIODE	
		D7010	1SS133	DIODE	
		D7101	1SS133	DIODE	
		D7102	1SS133	DIODE	
		R1	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R2	NRSA02J-561X	MG RESISTOR	560Ω,1/10W
		R3	NRSA02J-273X	MG RESISTOR	27kΩ,1/10W
		R7	NRSA02J-472X	MG RESISTOR,J465EK	4.7kΩ,1/10W
		R23	NRSA02J-822X	MG RESISTOR	8.2kΩ,1/10W
		R24	NRSA02J-682X	MG RESISTOR	6.8kΩ,1/10W
		R25	NRSA02J-152X	MG RESISTOR	1.5kΩ,1/10W
		R63	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R122	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R123	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R124	NRSA02J-681X	MG RESISTOR	680Ω,1/10W
		R131	QRE141J-0R0Y	RESISTOR	0Ω,1/4W

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
		R155	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R190	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R202	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R209	NRSA02J-512X	MG RESISTOR	5.1kΩ,1/10W
		R210	NRSA02J-182X	MG RESISTOR	1.8kΩ,1/10W
		R211	NRSA02J-562X	MG RESISTOR	5.6kΩ,1/10W
		R213	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R214	QRE141J-0R0Y	RESISTOR	0Ω,1/4W
		R216	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R218	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R2001	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R2002	QRE141J-103Y	RESISTOR	10kΩ,1/4W
		R2003	NRSA02J-682X	MG RESISTOR	6.8kΩ,1/10W
		R2004	NRSA02J-224X	MG RESISTOR	220kΩ,1/10W
		R2005	NRSA02J-181X	MG RESISTOR	180Ω,1/10W
		R2006	NRSA02J-273X	MG RESISTOR	27kΩ,1/10W
		R2007	NRSA02J-183X	MG RESISTOR	18kΩ,1/10W
		R2013	NRSA02J-473X	MG RESISTOR	47kΩ,1/10W
		R2014	NRSA02J-153X	MG RESISTOR	15kΩ,1/10W
		R2015	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R2016	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R2018	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R2019	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R2053	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R2054	NRSA02J-123X	MG RESISTOR	12kΩ,1/10W
		R2055	NRSA02J-3R3X	MG RESISTOR	3.3Ω,1/10W
		R2056	NRSA02J-820X	MG RESISTOR	82Ω,1/10W
		R2057	NRSA02J-473X	MG RESISTOR	47kΩ,1/10W
		R2058	NRSA02J-183X	MG RESISTOR	18kΩ,1/10W
		R2059	NRSA02J-473X	MG RESISTOR	47kΩ,1/10W
		R2060	NRSA02J-183X	MG RESISTOR	18kΩ,1/10W
		R3013	QRE141J-472Y	RESISTOR	4.7kΩ,1/4W
		R3014	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3015	QRE141J-472Y	RESISTOR	4.7kΩ,1/4W
		R3018	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3020	QRE141J-472Y	RESISTOR	4.7kΩ,1/4W
		R3021	QRE141J-472Y	RESISTOR	4.7kΩ,1/4W
		R3025	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3026	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3027	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3029	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3035	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3036	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3038	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3039	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R3040	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3041	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3042	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3044	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3046	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3047	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3048	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3049	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R3050	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R3051	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
		R3052	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
		R3053	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
		R3054	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3055	QRE141J-102Y	RESISTOR	1kΩ,1/4W
		R3056	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3057	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W

REF No.	PART No.	PART NAME, DESCRIPTION	
R3058	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
R3060	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
R3061	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
R3062	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
R3066	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
R3069	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
R3071	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
R3072	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
R3073	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
R3074	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
R3075	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
R3076	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
R3080	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
R3085	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
R3086	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
R3087	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
R3091	QRE141J-102Y	RESISTOR	1kΩ,1/4W
R3092	QRE141J-472Y	RESISTOR	4.7kΩ,1/4W
R3093	QRE141J-102Y	RESISTOR	1kΩ,1/4W
R3097	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
R3105	NRSA02J-221X	MG RESISTOR	220Ω,1/10W
R3201	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
R3202	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
R3203	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
R3204	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
R3205	QRE141J-181Y	RESISTOR	180Ω,1/4W
R3206	NRSA02J-183X	MG RESISTOR	18kΩ,1/10W
R3207	QRE141J-183Y	RESISTOR	18kΩ,1/4W
R3208	NRSA02J-181X	MG RESISTOR	180Ω,1/10W
R3209	NRSA02J-273X	MG RESISTOR	27kΩ,1/10W
R3210	NRSA02J-181X	MG RESISTOR	180Ω,1/10W
R3211	NRSA02J-273X	MG RESISTOR	27kΩ,1/10W
R3212	NRSA02J-474X	MG RESISTOR	470kΩ,1/10W
R3213	QRE141J-334Y	RESISTOR	330kΩ,1/4W
R3214	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
R3215	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
R3216	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
R3217	NRSA02J-562X	MG RESISTOR	5.6kΩ,1/10W
R3218	QRE141J-472Y	RESISTOR	4.7kΩ,1/4W
R3219	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
R3220	NRSA02J-104X	MG RESISTOR	100kΩ,1/10W
R3222	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
R3223	NRSA02J-152X	MG RESISTOR	1.5kΩ,1/10W
R3224	NRSA02J-152X	MG RESISTOR	1.5kΩ,1/10W
R3225	QRE141J-103Y	RESISTOR	10kΩ,1/4W
R3229	NRSA02J-105X	MG RESISTOR	1MΩ,1/10W
R3230	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
R3231	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
R3232	NRSA02J-473X	MG RESISTOR	47kΩ,1/10W
R3235	NRSA02J-152X	MG RESISTOR	1.5kΩ,1/10W
R3236	NRSA02J-152X	MG RESISTOR	1.5kΩ,1/10W
R4001	QRE141J-472Y	RESISTOR	4.7kΩ,1/4W
R4003	NRSA02J-561X	MG RESISTOR	560Ω,1/10W
R4004	NRSA02J-561X	MG RESISTOR	560Ω,1/10W
R4005	NRSA02J-562X	MG RESISTOR	5.6kΩ,1/10W
R4007	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
R4008	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
R4009	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
R4011	NRSA02J-392X	MG RESISTOR	3.9kΩ,1/10W
R4012	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
R4013	QRE141J-102Y	RESISTOR	1kΩ,1/4W

# ⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
	R4014	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
	R4015	NRSA02J-223X	MG RESISTOR	22kΩ,1/10W
	R4016	QRE141J-103Y	RESISTOR	10kΩ,1/4W
	R4017	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
	R4018	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
	R4019	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
	R4020	QRE141J-103Y	RESISTOR	10kΩ,1/4W
	R4021	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
	R5101	QRE141J-224Y	RESISTOR	220kΩ,1/4W
	R5102	QRE141J-224Y	RESISTOR	220kΩ,1/4W
	R5103	QRE141J-683Y	RESISTOR	68kΩ,1/4W
	R5104	QRG029J-154G	OMF RESISTOR	150kΩ,2W
	R5106	QRT01DJ-R39X	MF RESISTOR	0.39Ω,1W
	R5107	QRE121J-331Y	RESISTOR	330Ω,1/2W
	R5108	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
	R5109	NRSA02J-681X	MG RESISTOR	680Ω,1/10W
	R5110	NRSA02J-224X	MG RESISTOR	220kΩ,1/10W
	R5111	NRSA02J-821X	MG RESISTOR	820Ω,1/10W
	R5301	QRE141J-2R2Y	RESISTOR	2.2Ω,1/4W
	R5302	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
	R5303	NRSA02J-122X	MG RESISTOR	1.2kΩ,1/10W
⚠	R5304	QRZ9005-221X	FUSI RESISTOR	220Ω,1/4W
	R5305	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
	R5306	NRSA02J-333X	MG RESISTOR	33kΩ,1/10W
	R5319	QRE141J-511Y	RESISTOR	510Ω,1/4W
	R5320	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
	R5321	NRSA02J-221X	MG RESISTOR	220Ω,1/10W
	R5322	NRSA02J-473X	MG RESISTOR	47kΩ,1/10W
	R5324	QRE141J-102Y	RESISTOR	1kΩ,1/4W
	R5326	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
	R6020	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
	R6021	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
	R6022	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
	R6023	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
	R6030	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
	R6031	NRSA02J-271X	MG RESISTOR	270Ω,1/10W
	R6032	NRSA02J-122X	MG RESISTOR	1.2kΩ,1/10W
	R6050	QRE141J-0R0Y	RESISTOR	0Ω,1/4W
	R6051	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
	R6052	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
	R6080	NRSA02J-184X	MG RESISTOR	180kΩ,1/10W
	R6081	NRSA02J-683X	MG RESISTOR	68kΩ,1/10W
	R7001	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
	R7002	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
	R7003	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
	R7004	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
	R7005	QRE141J-103Y	RESISTOR	10kΩ,1/4W
	R7006	QRE141J-103Y	RESISTOR	10kΩ,1/4W
	R7007	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
	R7008	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
	R7010	NRSA02J-393X	MG RESISTOR,J260EK/J265EK	39kΩ,1/10W
	R7013	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
	R7014	QRE141J-0R0Y	RESISTOR	0Ω,1/4W
	R7015	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
	R7016	NRSA02J-331X	MG RESISTOR	330Ω,1/10W
	R7017	QRE141J-103Y	RESISTOR	10kΩ,1/4W
	R7020	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
	R7021	NRSA02J-122X	MG RESISTOR	1.2kΩ,1/10W
	R7022	QRE141J-182Y	RESISTOR	1.8kΩ,1/4W
	R7023	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
	R7024	NRSA02J-272X	MG RESISTOR	2.7kΩ,1/10W

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
		R7025	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R7026	QRE141J-682Y	RESISTOR	6.8kΩ,1/4W
		R7030	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R7031	NRSA02J-122X	MG RESISTOR	1.2kΩ,1/10W
		R7032	NRSA02J-182X	MG RESISTOR	1.8kΩ,1/10W
		R7033	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
		R7034	NRSA02J-272X	MG RESISTOR	2.7kΩ,1/10W
		R7035	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R7036	NRSA02J-682X	MG RESISTOR	6.8kΩ,1/10W
		R7037	NRSA02J-563X	MG RESISTOR	56kΩ,1/10W
		R7040	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R7041	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R7042	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R7101	NRSA02J-750X	MG RESISTOR	75Ω,1/10W
		R7102	NRSA02J-750X	MG RESISTOR	75Ω,1/10W
		R7103	NRSA02J-682X	MG RESISTOR	6.8kΩ,1/10W
		R7106	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R7107	NRSA02J-682X	MG RESISTOR	6.8kΩ,1/10W
		R7108	NRSA02J-750X	MG RESISTOR	75Ω,1/10W
		R7110	NRSA02J-682X	MG RESISTOR	6.8kΩ,1/10W
		R7111	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R7114	NRSA02J-682X	MG RESISTOR	6.8kΩ,1/10W
		R7152	QRE141J-471Y	RESISTOR	470Ω,1/4W
		R7153	QRE141J-511Y	RESISTOR	510Ω,1/4W
		R7155	NRSA02J-331X	MG RESISTOR	330Ω,1/10W
		R7158	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R7159	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R7160	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R7161	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R7162	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R7163	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
		R7164	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
		R7165	NRSA02J-221X	MG RESISTOR	220Ω,1/10W
		C1	QEKJ1CM-106	E CAPACITOR	10µF,16V
		C3	NCF21CZ-105X	CAPACITOR,J465EK	1µF,16V
		C5	NCF21CZ-105X	CAPACITOR,J465EK	1µF,16V
		C7	QEKJ0JM-107	E CAPACITOR	100µF,6.3V
		C9	NCF21CZ-105X	CAPACITOR	1µF,16V
		C11	NCF21CZ-105X	CAPACITOR	1µF,16V
		C12	NCB21CK-473X	CAPACITOR	0.047µF,16V
		C13	QEKJ1HM-335	E CAPACITOR	3.3µF,50V
		C14	NCB21EK-333X	CAPACITOR	0.033µF,25V
		C16	NCF21CZ-105X	CAPACITOR	1µF,16V
		C20	QEKJ1HM-225	E CAPACITOR	2.2µF,50V
		C21	NCB21EK-104X	CAPACITOR	0.1µF,25V
		C23	NCB21EK-223X	CAPACITOR	0.022µF,25V
		C24	NCB21CK-474X	CAPACITOR	0.47µF,16V
		C25	NCB21CK-224X	CAPACITOR	0.22µF,16V
		C29	QEKJ1EM-475	E CAPACITOR	4.7µF,25V
		C30	QEKJ1EM-475	E CAPACITOR,J465EK	4.7µF,25V
		C31	NCB21EK-223X	CAPACITOR,J465EK	0.022µF,25V
			NRSA02J-0R0X	MG RESISTOR,J260EK/J265EK	0Ω,1/10W
		C32	NCB21HK-103X	CAPACITOR	0.01µF,50V
		C34	QCC11EK-104	CAPACITOR	0.1µF,25V
		C37	QEKJ0JM-476	E CAPACITOR	47µF,6.3V
		C40	NCB21HK-103X	CAPACITOR	0.01µF,50V
		C41	NCB21EK-104X	CAPACITOR	0.1µF,25V
		C42	NCB21EK-103X	CAPACITOR	0.01µF,25V
		C43	NCF21HZ-103X	CAPACITOR	0.01µF,50V
		C45	NCB21EK-104X	CAPACITOR	0.1µF,25V
		C48	QEKJ0JM-476	E CAPACITOR	47µF,6.3V
		C49	NDC21HJ-331X	CAPACITOR	330pF,50V
		C51	QEQF1HM-225	NP E CAPACITOR	2.2µF,50V
		C54	QEKJ1HM-225	E CAPACITOR	2.2µF,50V
		C55	QERF1CM-106	E CAPACITOR	10µF,16V
		C56	QEKJ1HM-335	E CAPACITOR	3.3µF,50V
		C57	NCB21EK-104X	CAPACITOR	0.1µF,25V
		C58	NCB21EK-104X	CAPACITOR	0.1µF,25V
		C59	NCB21EK-104X	CAPACITOR	0.1µF,25V
		C60	NCB21EK-104X	CAPACITOR	0.1µF,25V
		C61	NDC21HJ-330X	CAPACITOR	33pF,50V
		C62	NCB21EK-104X	CAPACITOR	0.1µF,25V
		C63	NDC21HJ-151X	CAPACITOR	150pF,50V
		C64	QEKJ0JM-476	E CAPACITOR	47µF,6.3V
		C65	NCB21EK-104X	CAPACITOR	0.1µF,25V
		C81	NDC21HJ-150X	CAPACITOR	15pF,50V
		C82	NDC21HJ-150X	CAPACITOR	15pF,50V
		C83	NDC21HJ-150X	CAPACITOR,J465EK	15pF,50V
			NRSA02J-0R0X	MG RESISTOR,J260EK/J265EK	0Ω,1/10W
		C84	NDC21HJ-150X	CAPACITOR,J465EK	15pF,50V
			NRSA02J-0R0X	MG RESISTOR,J260EK/J265EK	0Ω,1/10W
		C85	NCB21EK-104X	CAPACITOR	0.1µF,25V
		C104	NDC21HJ-330X	CAPACITOR	33pF,50V
		C107	NDC21HJ-5R0X	CAPACITOR	5pF,50V
		C108	NCB21EK-104X	CAPACITOR	0.1µF,25V
		C121	NCB21HK-103X	CAPACITOR	0.01µF,50V
		C134	NCB21EK-104X	CAPACITOR	0.1µF,25V
		C135	NCB21EK-104X	CAPACITOR	0.1µF,25V
		C136	NCB11EK-104X	CAPACITOR	0.1µF,25V
		C152	NCB21HK-103X	CAPACITOR	0.01µF,50V
		C204	NDC21HJ-100X	CAPACITOR	10pF,50V
		C206	NDC21HJ-330X	CAPACITOR	33pF,50V
		C207	NDC21HJ-330X	CAPACITOR	33pF,50V
		C209	NCB21CK-474X	CAPACITOR	0.47µF,16V
		C212	NCB21EK-104X	CAPACITOR	0.1µF,25V
		C213	QEKJ1EM-475	E CAPACITOR	4.7µF,25V
		C214	NCB21CK-224X	CAPACITOR	0.22µF,16V
		C215	NCB21CK-224X	CAPACITOR	0.22µF,16V
		C216	QERF0JM-107	E CAPACITOR	100µF,6.3V
		C217	NDC21HJ-560X	CAPACITOR	56pF,50V
		C218	QERF1HM-105	E CAPACITOR	1µF,50V
		C222	QERF1HM-105	E CAPACITOR	1µF,50V
		C225	QERF0JM-107	E CAPACITOR	100µF,6.3V
		C226	QERF0JM-107	E CAPACITOR	100µF,6.3V
		C2002	QEKJ1CM-476	E CAPACITOR	47µF,16V
		C2003	NCB21HK-123X	CAPACITOR	0.012µF,50V
		C2004	QEKJ1CM-226	E CAPACITOR	22µF,16V
		C2005	NCB21HK-102X	CAPACITOR	0.001µF,50V
		C2006	NCB21HK-331X	CAPACITOR	330pF,50V
		C2007	QEKJ1CM-106	E CAPACITOR	10µF,16V
		C2008	NCB21HK-152X	CAPACITOR	0.0015µF,50V
		C2009	QEKJ1EM-475	E CAPACITOR	4.7µF,25V
		C2010	QEKJ1EM-475	E CAPACITOR	4.7µF,25V
		C2013	NCB21EK-333X	CAPACITOR	0.033µF,25V
		C2015	QEKJ1CM-226	E CAPACITOR	22µF,16V
		C2016	QEKJ1EM-475	E CAPACITOR	4.7µF,25V
		C2051	NCB21HK-331X	CAPACITOR	330pF,50V
		C2052	QFLC1HJ-823Z	F CAPACITOR	0.082µF,50V
		C2053	NCB21HK-472X	CAPACITOR	0.0047µF,50V
		C2054	NCB21HK-223X	CAPACITOR	0.022µF,50V
		C2055	QEKJ1CM-106	E CAPACITOR	10µF,16V
		C3001	NCB21CK-473X	CAPACITOR	0.047µF,16V

REF No.	PART No.	PART NAME, DESCRIPTION	
C3002	NCB21HK-103X	CAPACITOR	0.01μF,50V
C3003	QEKJ1HM-106	E CAPACITOR	10μF,50V
C3004	NCB21CK-473X	CAPACITOR	0.047μF,16V
C3011	QETL0JM-338	E CAPACITOR	3300μF,6.3V
C3012	QEKJ0JM-107	E CAPACITOR	100μF,6.3V
C3013	NCB21HK-103X	CAPACITOR	0.01μF,50V
C3014	QERF1CM-476	E CAPACITOR	47μF,16V
C3016	NCB21CK-473X	CAPACITOR	0.047μF,16V
C3019	NDC21HJ-101X	CAPACITOR	100pF,50V
C3020	NDC21HJ-101X	CAPACITOR	100pF,50V
C3021	NDC21HJ-101X	CAPACITOR	100pF,50V
C3022	NCB21CK-473X	CAPACITOR	0.047μF,16V
C3023	QEKJ1CM-106	E CAPACITOR	10μF,16V
C3024	NDC21HJ-120X	CAPACITOR	12pF,50V
C3026	NCB21HK-103X	CAPACITOR	0.01μF,50V
C3027	QEKJ1CM-106	E CAPACITOR	10μF,16V
C3028	NDC21HJ-101X	CAPACITOR	100pF,50V
C3029	NDC21HJ-101X	CAPACITOR	100pF,50V
C3030	QEKJ1CM-476	E CAPACITOR	47μF,16V
C3031	NCB21CK-473X	CAPACITOR	0.047μF,16V
C3032	NCB21CK-473X	CAPACITOR	0.047μF,16V
C3033	NCB21CK-473X	CAPACITOR	0.047μF,16V
C3036	NDC21HJ-180X	CAPACITOR	18pF,50V
C3037	NDC21HJ-120X	CAPACITOR	12pF,50V
C3038	NDC21HJ-101X	CAPACITOR	100pF,50V
C3039	NDC21HJ-101X	CAPACITOR	100pF,50V
C3040	NCB21CK-473X	CAPACITOR	0.047μF,16V
C3041	NDC21HJ-100X	CAPACITOR	10pF,50V
C4001	QERF1CM-476	E CAPACITOR	47μF,16V
C4002	NCB21CK-473X	CAPACITOR	0.047μF,16V
C4003	NCB21HK-102X	CAPACITOR	0.001μF,50V
C4004	QERF1CM-226	E CAPACITOR	22μF,16V
C4005	NCB21HK-222X	CAPACITOR	0.0022μF,50V
C4006	QEKJ1CM-476	E CAPACITOR	47μF,16V
C4008	QEQF1HM-105	NP E CAPACITOR	1μF,50V
C4009	NCB21HK-563X	CAPACITOR	0.056μF,50V
C4010	NCB21EK-223X	CAPACITOR	0.022μF,25V
C4011	NCB21CK-104X	CAPACITOR	0.1μF,16V
C4012	QEKJ1HM-224	E CAPACITOR	0.22μF,50V
C4013	NCB21HK-563X	CAPACITOR	0.056μF,50V
C4014	NDC21HJ-101X	CAPACITOR	100pF,50V
C4015	NCB21HJ-102X	CAPACITOR	0.001μF,50V
C5001	QFZ9051-683	F CAPACITOR	0.068μF,250V
C5002	QFZ9051-333	F CAPACITOR	0.033μF,250V
C5005	QCZ9071-222	CAPACITOR	0.0022μF,250V
C5006	QEZ0374-686	E CAPACITOR	68μF,400V
C5101	QCZ0212-472	CAPACITOR	0.0047μF,1kV
C5102	QCZ0302-330Z	CAPACITOR	33pF,1kV
C5104	QETC1HM-105	E CAPACITOR	1μF,50V
C5105	QFN31HJ-183	F CAPACITOR	0.018μF,50V
C5106	QCBB1HJ-271	CAPACITOR	270pF,50V
C5107	QFV11HJ-104	F CAPACITOR	0.1μF,50V
C5201	QEMU0JM-227	E CAPACITOR	220μF,6.3V
C5202	QEMT1CM-827	E CAPACITOR	820μF,16V
C5203	QEMT1AM-687	E CAPACITOR	680μF,10V
C5204	QETN2AM-475	E CAPACITOR	4.7μF,100V
C5205	QETC1HM-106	E CAPACITOR	10μF,50V
C5207	QETN1CM-227	E CAPACITOR	220μF,16V
C5208	QETN1AM-227	E CAPACITOR	220μF,10V
C5301	QEMU0JM-227	E CAPACITOR	220μF,6.3V
C5302	QETC1HM-106	E CAPACITOR	10μF,50V

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
		C5303	QETN1CM-107	E CAPACITOR	100μF,16V
		C5304	QFLC1HJ-183Z	F CAPACITOR	0.018μF,50V
		C5305	NCF21HZ-103X	CAPACITOR	0.01μF,50V
		C5306	QETN1AM-107	E CAPACITOR	100μF,10V
		C5307	QETN1CM-226	E CAPACITOR	22μF,16V
		C5308	QEKC1CM-476	E CAPACITOR	47μF,16V
		C5309	QETN1CM-107	E CAPACITOR	100μF,16V
		C6006	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C6008	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C6012	QEKJ1CM-476	E CAPACITOR	47μF,16V
		C6013	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C6014	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C6016	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C6032	NCB21HK-473X	CAPACITOR	0.047μF,50V
		C6037	QEKJ1HM-106	E CAPACITOR	10μF,50V
		C6080	NRSA02J-0R0X	MG CAPACITOR	0Ω,1/10W
		C7002	QEKJ1HM-106	E CAPACITOR	10μF,50V
		C7007	QEKJ0JM-476	E CAPACITOR	47μF,6.3V
		C7009	NDC21HJ-220X	CAPACITOR	22pF,50V
		C7010	NCB21CK-473X	CAPACITOR	0.047μF,16V
		C7011	QEKJ1CM-476	E CAPACITOR	47μF,16V
		C7020	QDVB1EZ-223Y	CAPACITOR	0.022μF,25V
		C7021	NCB21CK-473X	CAPACITOR	0.047μF,16V
		C7101	NCB21HK-681X	CAPACITOR	680pF,50V
		C7102	NCB21HK-681X	CAPACITOR	680pF,50V
		C7103	NCB21HK-102X	CAPACITOR	0.001μF,50V
		C7104	NCB21HK-102X	CAPACITOR	0.001μF,50V
		C7109	NCB21HK-681X	CAPACITOR	680pF,50V
		C7110	NCB21HK-681X	CAPACITOR	680pF,50V
		C7151	QEKJ1CM-476	E CAPACITOR	47μF,16V
		C7152	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C7153	NCB21HK-223X	CAPACITOR	0.022μF,50V
		C7154	NCB21HK-223X	CAPACITOR	0.022μF,50V
		C7155	NCB21HK-223X	CAPACITOR	0.022μF,50V
		C7156	NCB21HK-223X	CAPACITOR	0.022μF,50V
		C7157	QEKJ1CM-106	E CAPACITOR	10μF,16V
		C7158	QEKJ1CM-106	E CAPACITOR	10μF,16V
		C7159	QEKJ1CM-106	E CAPACITOR	10μF,16V
		C7160	QEKJ1CM-106	E CAPACITOR	10μF,16V
		C7161	QEKJ1CM-476	E CAPACITOR	47μF,16V
		C7162	QEKJ1CM-476	E CAPACITOR	47μF,16V
		C7163	QEKJ1CM-476	E CAPACITOR	47μF,16V
		C7166	NDC21HJ-330X	CAPACITOR	33pF,50V
		C7167	NDC21HJ-680X	CAPACITOR	68pF,50V
		C7169	NDC21HJ-330X	CAPACITOR	33pF,50V
		C7171	NCB21EK-104X	CAPACITOR	0.1μF,25V
		L1	QQL29BJ-100Z	COIL	10μH
		L4	QQL29BJ-100Z	COIL	10μH
		L7	QQL29BK-R22Z	COIL	0.22μH
		L8	QQL29BJ-101Z	COIL	100μH
		L9	QQL29BJ-100Z	COIL	10μH
		L16	QQL29BJ-100Z	COIL	10μH
		L18	QQR0967-001	COIL	12μH
		L104	QQL231J-1R0Y	COIL	1μH
		L201	QQL29BK-1R0Z	COIL	1μH
		L202	QQL231J-330Y	COIL	33μH
		L203	QQL29BJ-220Z	COIL	22μH
		L204	QQL29BJ-100Z	COIL	10μH
		L206	QQL29BJ-220Z	COIL	22μH
		L5201	PELN1184	COIL	33μH
		L5202	PELN1184	COIL	33μH

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
		L5301	QQL01BK-101Z	COIL	100µH
		L6003	QQL29BJ-100Z	COIL	10µH
		L6080	QQL29BK-1R0Z	COIL	1µH
		L7101	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		L7102	NQL092M-R22X	COIL	0.22µH
		L7153	QQL231J-1R0Y	COIL	1µH
		L7155	QQL231J-1R0Y	COIL	1µH
		X1	QAX0530-001	CRYSTAL RESONATOR	
		X3001	QAX0445-001	CRYSTAL RESONATOR	
		X3002	QAX0527-001	CRYSTAL RESONATOR	
		S3001	QSW0602-003	PUSH SWITCH,REC SAFETY	
		S7001	QSW0456-002Z	TACT SWITCH,STAND BY	
		S7002	QSW0456-002Z	TACT SWITCH,TIMER	
		S7004	QSW0456-002Z	TACT SWITCH,CH-	
		S7006	QSW0456-002Z	TACT SWITCH,CH+	
		S7008	QSW0456-002Z	TACT SWITCH,DISPLAY	
		S7010	QSW0456-002Z	TACT SWITCH,REC	
		S7011	QSW0456-002Z	TACT SWITCH,REW	
		S7012	QSW0456-002Z	TACT SWITCH,STOP/EJECT	
		S7013	QSW0456-002Z	TACT SWITCH,PLAY	
		S7014	QSW0456-002Z	TACT SWITCH,PAUSE	
		S7015	QSW0456-002Z	TACT SWITCH,FF	
		S7016	QSW0456-002Z	TACT SWITCH,ST BOX	
		K5101	QQR0678-001Z	FERRITE BEAD	
		PC3001	GP3S123	IC(PHOTO SENSOR)	
		PC3002	GP3S123	IC(PHOTO SENSOR)	
	⚠	PC5101	PC123F2	PH COUPLER	
		T2051	PELN0832	OSC TRANSFORMER	
	⚠	T5001	QQS0033-001	SW TRANSFORMER	
	⚠	TB1	LP20317-001B	TERMINAL BOARD(PAL)	
		ET1	PQ21623-2-5	EARTH PLATE(RF)	
		SD1	LP30530-001B	SHIELD CASE(PRE)	
		TU6001	QAU0105-001	TUNER	
		DI7001	QLF0031-001	FL TUBE	
		HD1	PQ35479-1-4	HOLDER(FDP),DI7001	
	⚠	HS1	LP40090-001A	HEAT SINK,Q5101	
		OT1	QYTDST3006Z	SCREW,Q5101	
		FC5001	QNG0006-001Z	FUSE CLIP,F5001	
		FC5002	QNG0006-001Z	FUSE CLIP,F5001	
		J7101	PEMC1104	RGB21PIN SOCKET,A/V1 I/O	
		J7102	PEMC1104	RGB21PIN SOCKET,A/V2 DECODER	
	⚠	LF5001	PELN1204-01-01	LINE FILTER	
	⚠	LF5002	QQR0608-001	LINE FILTER	
		CN1	QGF1028C2-08	FPC CONNECTOR,(1-8)U.DRUM,J465EK	
			QGF1028C3-04	FPC CONNECTOR,(5-8)U.DRUM,J260EK/J265EK	
		CN2001	QGF1207C1-07	FPC CONNECTOR,(1-7)A/C HEAD	
		CN2002	QGB2532J1-02	CONNECTOR,(1-2)FE HEAD	
		CN3001	QGF1207C1-05	FPC CONNECTOR,(1-5)DRUM MDA	
		CN3002	QGB2532J1-02	CONNECTOR,(1-2)L.MOTOR	
		CN3003	QGB2015M2-08	CONNECTOR,(1-8)CAP.MOTOR	
		CN3004	QGB2534J2-04	CONNECTOR,(1-4)R.ENCODER	
	⚠	CN5001	QGA7901C3-02	CONNECTOR,(1-2)AC IN	
		CN7002	QGB2530K1-03	CONNECTOR,(1-3)LED	
	⚠	CP3001	ICP-N25	CIRCUIT PROTECTOR	
	⚠	CP4001	ICP-N15	CIRCUIT PROTECTOR	
	⚠	CP5301	ICP-N38	CIRCUIT PROTECTOR	
	⚠	F5001	QMF51E2-1R6J1	FUSE	T1.6A,AC250V

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION

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AUDIO CONTROL HEAD BOARD ASSEMBLY <12>

PW1	LPA10010-01A1	A/C HEAD BOARD ASSY
CN1	QGF1208F1-07	FPC CONNECTOR

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LOADING MOTOR BOARD ASSEMBLY<55>

PW2	LPA10010-01A2	LOADING MOTOR BOARD ASSY
CN1	QGB2533K1-02	CONNECTOR

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LED BOARD ASSEMBLY <90>

PW2	LPA10045-01A2	LED BOARD ASS'Y
D7033	SLR-342VR3F	LE DIODE
HD1	PQM30038-1-2	LED HOLDER,D7033
CN7005	QGB2530J1-03	CONNECTOR,(1-3)